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Meridian 1

# **Meridian Companion**

## **Installation and Maintenance Guide**

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# Introduction to Meridian Companion

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The Meridian Companion application integrates wireless telephone capability into a Meridian 1 system. Meridian Companion uses radio technology to transmit and receive signals between portable (wireless) telephones and Base Stations connected to a Meridian 1 system.

## Preparing to install a Meridian Companion system

Before using this guide, read *Meridian Companion Product Overview*.

The following must be completed before installing the Meridian Companion system:

- ☐ site planning (the process of determining the location and number of Base Stations required at a customer site)
- ☐ installation of the wiring required for the Base Stations
- ☐ installation of AC power for a plug-top power supply to power each Base Station or for a remote power interconnect (RPI) unit to power multiple Base Stations
- ☐ installation of primary protectors for Base Stations in applications with external exposed wiring and provisioning for placement of the secondary protectors, as needed
- ☐ for an ST/STE, RT, NT, or XT system, an upgrade so that the system has an IPE Module or a CE/PE Module

- ❑ preparation of the IPE Module or CE/PE Module to ensure the following:
  - availability of sufficient contiguous slots for Meridian Companion cards (Option 11 may require an expansion cabinet)
  - placement of all power and main distribution frame (MDF) cables

Information derived during the site planning process is entered in *Meridian Companion Programming and Provisioning Record*. Installation requires a copy of this document plus the annotated site floor plans that were used during site planning. Check this record to make sure that all equipment and supplies are available.

*Meridian Companion Site Planning Reference Manual* describes these preinstallation steps.

## Installing a Meridian Companion system

Installing a Meridian Companion system involves the following:

- installing, wiring, and powering hardware components:
  - Base Stations and any external antennas
  - plug-top power supplies, where required
  - RPI units, if used
  - Remote Access Device (RAD)
  - Administration Terminal, if used
- cross connecting Base Station Time Compression Multiplexing (TCM) wires at the main distribution frame (MDF) and installing any secondary protectors needed for external exposed wiring
- connecting the RAD and setting up line for remote access
- attaching the feature ROM card to the Companion Meridian Controller card (CMCC), and then installing the Companion expansion cards in an IPE or CE/PE Module

- programming the Meridian Companion system (using the Administration Terminal or Companion Manager), excluding user options
- preparing a radio cell assignment list for Base Stations based on what you observe during reevaluation
- verifying the mobility system and making corrections as necessary
- programming the Meridian 1 wireless terminal numbers (WTNs) and enabling the cards
- programming the user options in the Meridian Companion system
- registering and verifying individual user portables
- completing *Meridian Companion Programming and Provisioning Record*

*Companion Manager Installation and Operations Guide* describes the installation, operations, administration, and maintenance of Meridian Companion systems through Companion Manager, a Microsoft Windows<sup>®</sup> application that runs on the Administration PC. You can use Companion Manager instead of or in addition to the Administration Terminal.

*Meridian Companion Administration Terminal Operations Guide* describes the programming and management of the portable telephones.

## Installation warnings

Read this section carefully to ensure your safety and the safe operation of the Meridian Companion system.



### **WARNING!**

Do not connect the Administration Terminal, Base Stations, or RAD directly to a central office (CO) line interface. Doing so may result in equipment damage.



### **WARNING!**

To avoid damage to equipment, do not insert the plug at the free end of an Administration Terminal cord directly into a wall or baseboard outlet.



### **SHOCK!**

Check the lightning surge arrestors at the cable entry point to the building and pay special attention to the grounding.

Report any problems to the telephone company in writing. Because Administration Terminals, Base Stations, and RADs are not lightning protected, do not install them outside the building.



### **SHOCK!**

To avoid electrical shock hazard to personnel or equipment, observe the following precautions when installing telephone equipment:

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch noninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying the telephone lines.



### **CAUTION!**

To eliminate the possibility of accidental damage to cords, plugs, jacks, and other system components, do not use sharp instruments during assembly procedures.



### **CAUTION!**

Base Stations can be used off-premises only with proper regulatory authority.

### **ATTENTION!**

The Administration Terminal must not be used as off-premises equipment.

## Safety precautions

When using your telephone equipment, basic safety precautions should always be followed to reduce the risk of fire, electric shock, damage to equipment, and injury to persons, including the following:



### **WARNING!**

Unplug the system from the AC outlet and refer servicing to qualified service personnel under the following conditions:

- when a power cord is damaged or frayed
- if the equipment has been exposed to rain, or liquid has been spilled on any part of it (if this happens, allow the equipment to dry out, unplugged, to see if it still operates; do not disassemble the equipment)
- if the housing of any part of the equipment has been damaged



### **SHOCK!**

To avoid fire or electrical shock, do not overload AC outlets and extension cords.



### **SHOCK!**

To reduce the risk of electric shock, do not disassemble the equipment. When any service or repair work is required, contact a qualified service person.





## **SHOCK!**

Install an AC lightning surge arrester in the AC outlet that connects to the equipment.

Electrical surges, typically lightning transients, are very destructive to terminal equipment connected to AC power sources.



## **WARNING!**

Unplug the equipment from the AC outlet before cleaning with a damp cloth. Do not use liquid or aerosol cleaners.



## **CAUTION!**

Do not place any part of the equipment

- on an unstable cart, stand or table
- near or over a radiator or heat vent
- in an enclosure unless proper ventilation is provided



## **CAUTION!**

Do not allow anything to rest on the power cord.

Do not locate the equipment where someone may walk on the power cord.



### **CAUTION!**

Never push objects of any kind into the equipment slots.



### **WARNING!**

Do not use any part of the equipment near water.

Never spill liquids on the equipment.



### **WARNING!**

Do not use any telephone in the vicinity of a gas leak to report the leak.



### **CAUTION!**

Slots and openings in the cabinet and the back or bottom are provided for ventilation. To protect the equipment from overheating, do not block or cover these openings.



### **CAUTION!**

The equipment has a three-wire grounding type plug with a third (grounding) pin. This plug fits into a grounding type AC outlet only. This is a safety feature. If you are unable to insert the plug into the AC outlet, contact your electrician to replace your obsolete AC outlet.

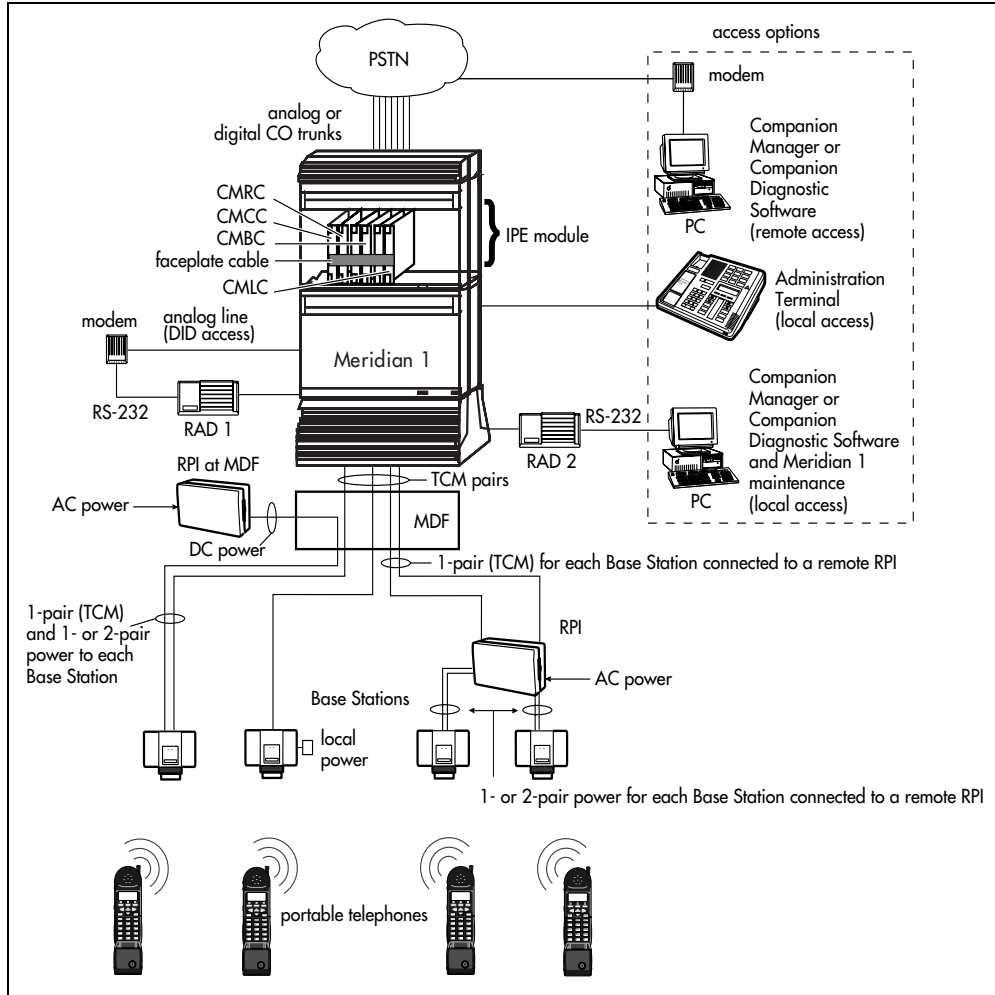
**ATTENTION!**

Heed the warnings and follow the instructions marked on the Meridian Companion system.

## System overview

Figure 1 shows an overview of the Meridian Companion configuration.

**Figure 1 : Meridian Companion overview**



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## Installing the hardware

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This section includes information on installing a Meridian Companion system. Installation should proceed in the following order:

- install Base Stations and Base Station plug-top power supplies
- install remote power interconnect units
- install external antennas and lightning surge arrestors
- install a Companion Administration Terminal
- install a Remote Access Device
- wire the Time Compression Multiplexing (TCM) lines
- install Meridian Companion cards

**Note:** If you plan to use Companion Manager instead of or in addition to the Administration Terminal, refer to *Companion Manager Installation and Operations Guide*.

## Installing Base Stations

Before installing a Base Station, verify the position as documented in the *Meridian Companion Programming and Provisioning Record*.

### Installation guidelines

#### **ATTENTION!**

**Each Base Station must be installed within 1200 m (TCM wiring length) of the Meridian Companion system.**

Consider the following points when installing Base Stations or Base Station plug-top power supplies:

- Ensure that the installation complies with your local electrical code.
- Install Base Stations indoors where there is no condensation and the temperature remains between 0°C and 50°C, preferably between 15°C and 35°C.
- Install all Base Stations within 1200 m (wiring length) of the Meridian 1 system.
- Do not position Base Stations on large concrete or marble columns. Base Stations must be at least 1 m from such columns. Locate all Base Stations at a cell center on the same side of such columns.
- Position Base Stations on ceilings, or upright against walls close to the ceiling on surfaces with the same material composition.
- Allow a clearance of at least 9 cm between the Base Stations and surrounding objects, excluding other Base Stations (see Figure 2 on page 14).
- Position all the Base Stations at the same cell center a maximum of 1.5 m apart, with a minimum of 9 cm between the Base Stations (see Figure 2 on page 14).
- Do not position Base Stations in ducts, plenums, or hollow spaces used to transport environmental air.

- Position Base Stations away from where a portable is used in an office area by at least the amount shown in Table 1. Installing the Base Stations on ceilings or high on walls helps to maintain these minimum distances.

**Table 1 : Minimum distance between office areas and Base Stations**

<b>Number of Base Stations in the cell</b>	<b>Minimum distance between office areas and Base Stations</b>
1	1 m
2	1.4 m
3	1.8 m
4	2 m

- If powering with plug-top power, position the Base Station within 4 m of an AC outlet, since the plug-top power supply has a 4-metre cord. Keep these points in mind:
  - the power supply must be located in an area accessible to a properly grounded AC outlet
  - the input plug is part of the power supply (the only way to remove power is to disconnect the power supply)
  - if you must install a new AC outlet to accommodate the power supply, ensure that the AC outlet is mounted with sufficient clearance to plug the power supply
  - if more than one Base Station is installed at a cell center, ensure that each plug-top power supply has a separate AC outlet

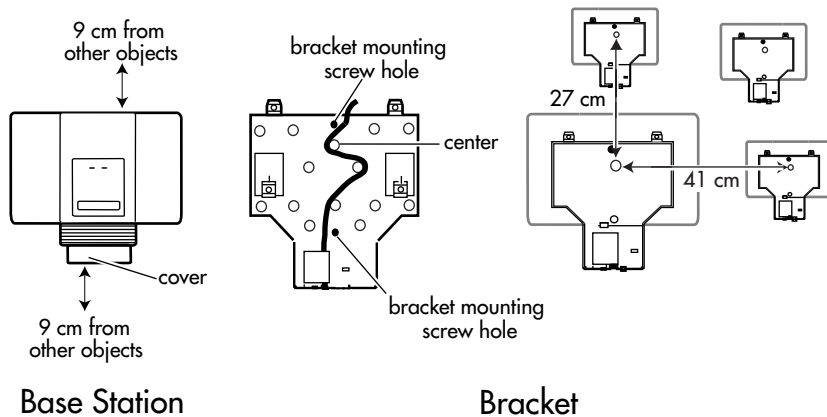
## Powering a Base Station

Base Stations can be powered by plug-top power supplies or remote power interconnect units. See “Installing remote power interconnect units” or “Mounting a Base Station plug-top power supply” for your configuration.

## Mounting a Base Station

Base Stations can be mounted on a wall or on a ceiling (when mounting on a wall, install it with the cover at the bottom, as shown in Figure 9 on page 21). Allow for the following clearance around the Base Station.

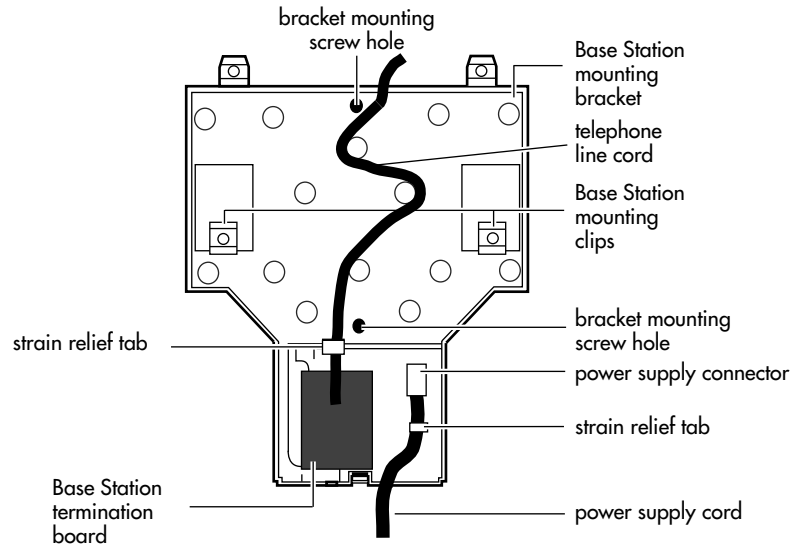
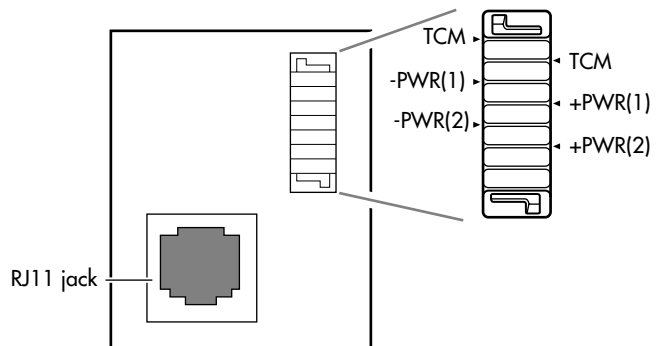
**Figure 2 : Clearance for the Base Station**



### Mounting a Base Station

1. Fasten the bracket into position using two 4 mm screws.
2. Route the telephone cable from the distribution block through the top (or bottom) opening.
3. Wind any excess telephone cable around the posts to secure it, then fasten it under the strain relief.
4. Connect the cable wires to the BIX connector on the termination board as shown in Figure 4 on page 15.



**Figure 3 : Base Station mounting bracket detail****Figure 4 : Termination board**

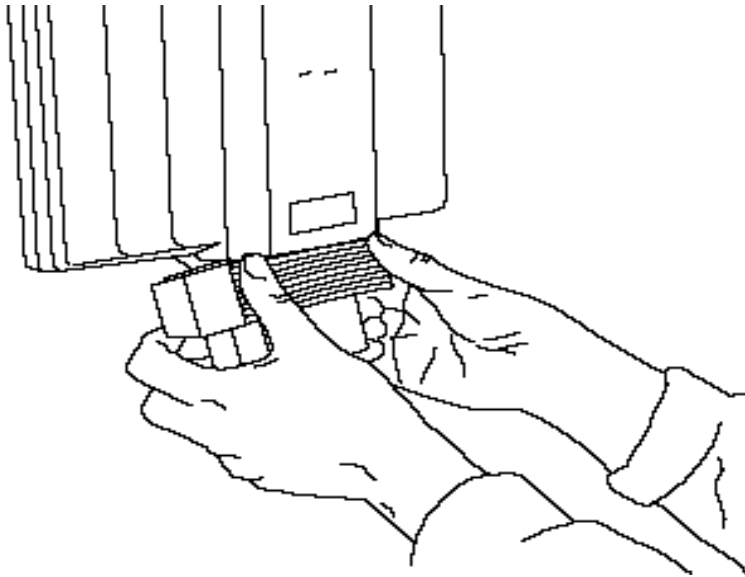
5. Mount the Base Station onto the bracket, snapping it into position.
6. Connect the power RJ11 jumper lead to the RJ11 jacks on the termination board and the Base Station.

7. Record the associated port number in the space provided on the printed label affixed on the lower right corner of the mounting bracket.

**Note:** Include the labeling information for each Base Station on the completed installation floor plans and the *Meridian Companion Programming and Provisioning Record* for reference.

8. Slide the cover onto the bracket, using the guide to position it properly. Snap the cover into place.

**Figure 5 : Sliding cover onto bracket**



## Installing remote power interconnect units

Figures 6 and 7 illustrate two possible configuration options using a remote power interconnect (RPI) unit.

Figure 6 shows a configuration that is appropriate for a small installation where there is no main distribution frame (MDF). In this case, the RPI MDF capabilities provide the connections between the Meridian 1 system, Base Station power, and Base Stations. Essentially, the RPI unit functions as a distribution panel. This configuration can also be used if the existing MDF is

full or if the customer wants to keep the wiring separate from the other telephone set wiring.

**Note:** The polarity of the TCM connections is not important. If *two* power pairs are brought in, they must be connected with the *same polarity* to the termination board.



**WARNING!**

**When using two power pairs, ensure they are connected with the same polarity.**

**Figure 6 : Base Station powering: RPI configuration option 1**

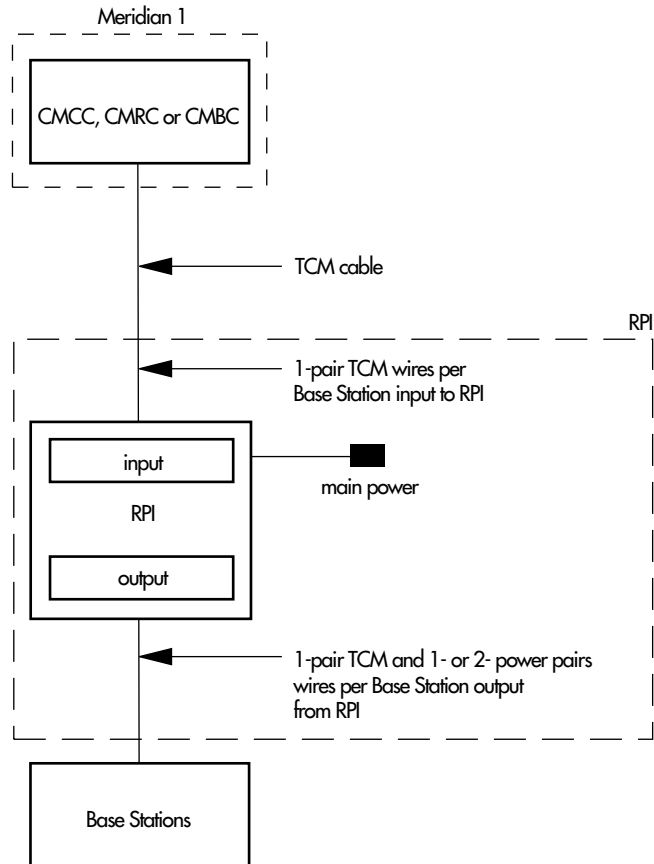
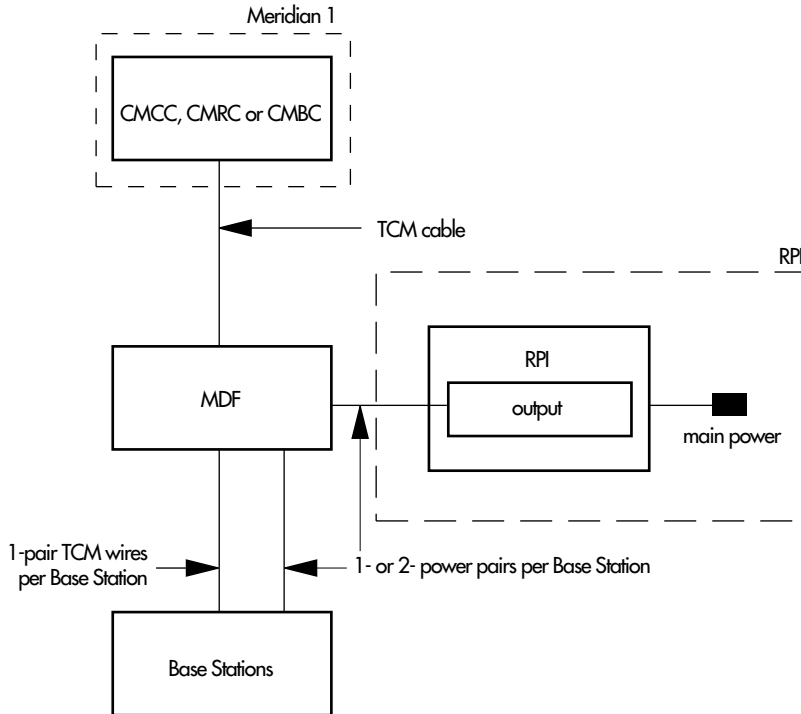


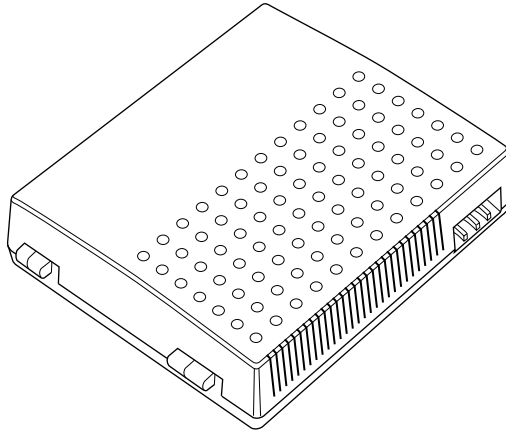
Figure 7 shows a configuration that would be suitable for a system that has an existing MDF. Typically the MDF is located in the same room as the Meridian 1 system, although it could be a closet MDF. In either case the Base Stations are wired through the MDF rather than the RPI unit.

**Figure 7 : Base Station powering: RPI configuration option 2**



An illustration of an RPI unit appears in Figure 8. Figure 9 illustrates RPI components.

**Figure 8 : RPI unit**



**ATTENTION!**

**The RPI unit should have the dc backup power supplied by a UL listed UPS.**

The UPS should have an output voltage rating of 44 to 50 V dc, with a maximum fault current limit of 6 A to protect the RPI's output wiring. Otherwise, it may be necessary to use class 1 wiring.

**ATTENTION!**

**The RPI units must always be installed inside a building.**

The AC outlet powering the RPI unit should be installed near the equipment and should be easily accessible.

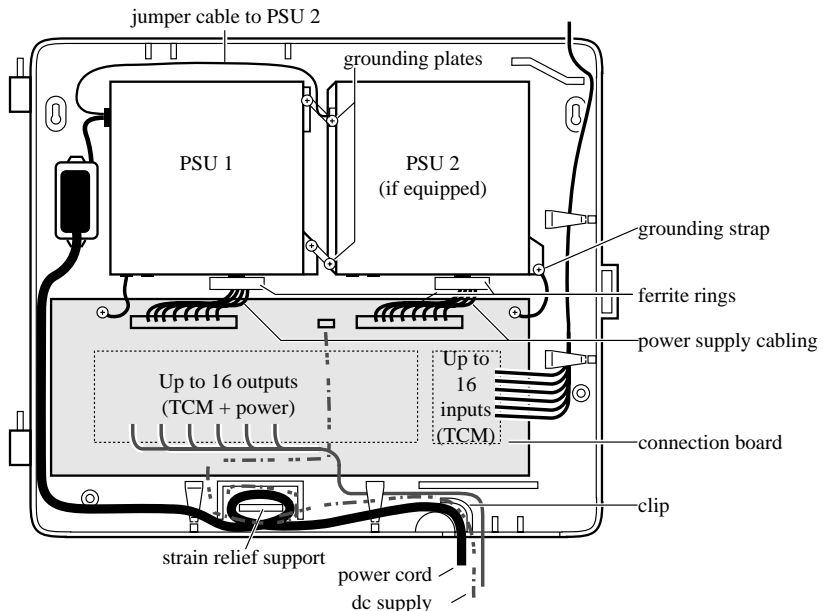
The length of the RPI cord, from the outside surface of the unit to the plug, should be a minimum of 2 m and a maximum of 4.5 m.



## WARNING!

An RPI unit should not be installed where its outputs are exposed, even when the Base Station is installed with the TCM lines exposed. An RPI unit should be installed in the same building as the Base Stations the RPI supports.

**Figure 9 : RPI components**



There are two versions of the RPI unit: the RPI-8 BIX UL, which supports up to eight Base Stations; and the RPI-16 BIX UL, which supports up to 16 Base Stations. Each RPI has a connection board and either one (RPI-8 BIX UL) or two (RPI-16 BIX UL) power supply units. The maximum input power consumption of an RPI is 240 W. If a UPS 48 V dc backup source is used, the maximum input power requirement of the RPI is 140 W.

You can upgrade an RPI-8 BIX UL to an RPI-16 BIX UL by attaching a second power supply unit to the RPI-8 as described on page 31.

To determine the type and number of power supply units you need for a given number of Base Stations, use Table 2 on page 22.

**Note:** If RPIs are distributed throughout the site, the number and type of RPIs will depend on the placement and powering plan of the Base Stations.

**Table 2 : RPI requirements**

<b>Base Stations</b>	<b>Number of RPI-16 BIX UL and RPI-8 BIX UL required</b>
1–8	1 RPI-8 BIX UL
9–16	1 RPI-16 BIX UL
17–24	1 RPI-16 BIX UL and 1 RPI-8 BIX UL
25–32	2 RPI-16 BIX UL
33–40	2 RPI-16 BIX UL and 1 RPI-8 BIX UL
41–48	3 RPI-16 BIX UL
49–56	3 RPI-16 BIX UL and 1 RPI-8 BIX UL
57–64	4 RPI-16 BIX UL
65–72	4 RPI-16 BIX UL and 1 RPI-8 BIX UL
73–80	5 RPI-16 BIX UL
81–88	5 RPI-16 BIX UL and 1 RPI-8 BIX UL
89–96	6 RPI-16 BIX UL
97–104	6 RPI-16 BIX UL and 1 RPI-8 BIX UL
105–112	7 RPI-16 BIX UL
113–120	7 RPI-16 BIX UL and 1 RPI-8 BIX UL
121–128	8 RPI-16 BIX UL
129-136	8 RPI-16 and 1 RPI-8
137-144	9 RPI-16
145-152	9 RPI-16 and 1 RPI-8
153-160	10 RPI-16
161-168	10 RPI-16 and 1 RPI-8




**Table 2 : RPI requirements (continued)**

<b>Base Stations</b>	<b>Number of RPI-16 BIX UL and RPI-8 BIX UL required</b>
169-176	<b>11</b> RPI-16
177-184	<b>11</b> RPI-16 and <b>1</b> RPI-8
185-192	<b>12</b> RPI-16
193-200	<b>12</b> RPI-16 and <b>1</b> RPI-8
201-208	<b>13</b> RPI-16
209-216	<b>13</b> RPI-16 and <b>1</b> RPI-8
217-224	<b>14</b> RPI-16
225-232	<b>14</b> RPI-16 and <b>1</b> RPI-8
233-240	<b>15</b> RPI-16

The system configuration dictates how many RPIs are required.

### Installing an RPI unit

1. Mount the RPI as described in “Mounting the remote power interconnect unit” on page 24.
2. Wire the RPI as described in “Wiring the RPI unit” on page 26.



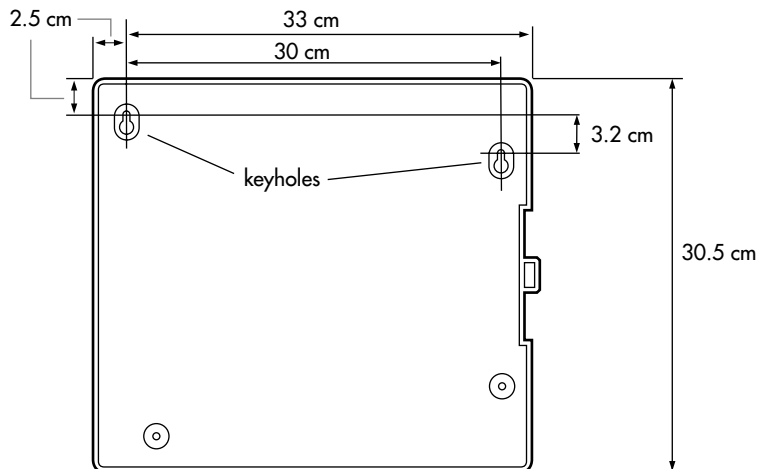
**WARNING!**

**Do not power up the RPI until the installation is complete, including the installation of Base Station cross-connectors.**

If you are adding extra lines for Base Stations, always power down the RPI before you begin.

### Mounting the remote power interconnect unit

Figure 10 : RPI mounting holes



**Note:** Mounting hardware is not supplied.

1. Position the screw holes for the RPI using the dimensions shown in Figure 10.

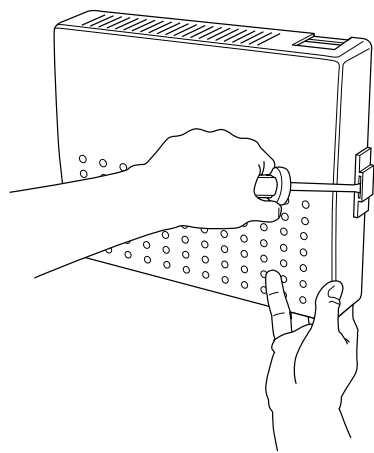
To provide adequate ventilation and to prevent overheating, leave a clearance of at least 13 cm around the RPI.

If mounting two RPIs, one above the other, leave a clearance of at least 1 ft between them to provide adequate ventilation and to prevent overheating.

2. Insert molly screws in the holes.
3. Partially screw in two 4 mm, 5-cm long screws for the keyholes.
4. Open the hinged cover with a screwdriver by pushing in and then down to release the catch on the right side, as shown in Figure 11. You can remove the cover by taking it off its hinges.
5. Hang the RPI on the two keyhole screws and tighten them.
6. Install the remaining two screws.
7. Feed in the power cord through the bottom of the RPI and route it through the clip and around the strain relief support as shown in Figure 9.
8. Route the power cord to the input power jack just to the left of PSU 1. Connect the plug to the jack.

**Note:** Labeling RPIs distinctively may help with diagnosis if there are problems in the future.

**Figure 11 : Opening the RPI cover**



**Wiring the RPI unit**



**WARNING!**


**Do not run unprotected power cables outdoors.**

The outputs of an RPI unit should not be wired so that its lines are exposed.

The maximum two-way (between the RPI and the Base Station) dc loop resistance for power pairs is *90 ohms*. Each Base Station needs one or two power pairs. The exact number depends on the wire size of the power pairs and the distance between the Base Station and the RPI. Table 3 shows the approximate maximum cabling distances. Remember that interconnections increase the loop resistance.

**Table 3 : Maximum cabling from RPI to Base Station**

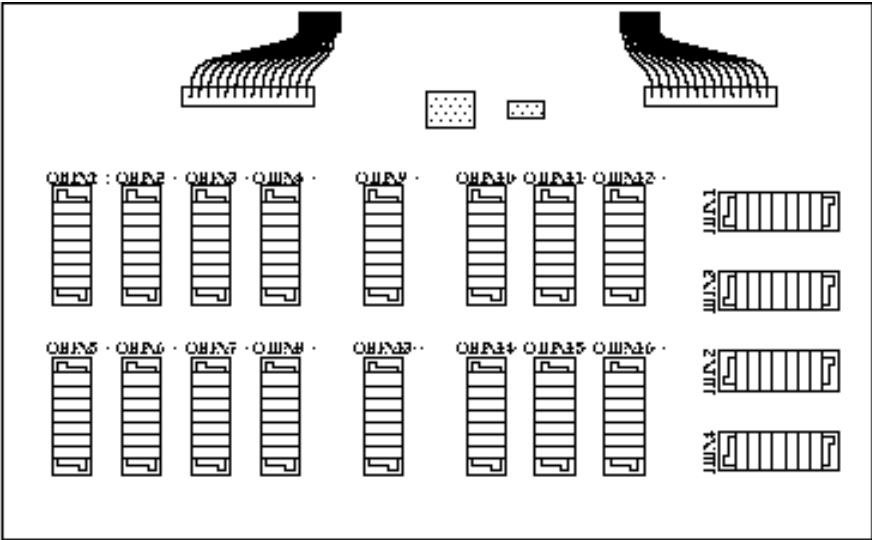
Wire size	Single-pair	Double-pair
0.6 mm (22 AWG)	800 m	1200 m
0.5 mm (24 AWG)	500 m	1000 m



**WARNING!**

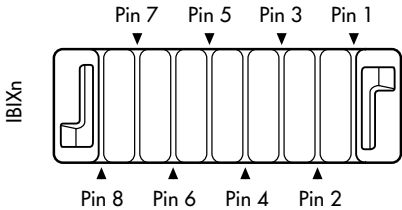
When using two power pairs, ensure they are connected with the same polarity.

Figure 12 : RPI BIX connector board



**Input connections**

Figure 13 : BIX input connector pinout



### Wiring the RPI

1. Feed the TCM input pairs through the top of the RPI and route the pairs to the input connectors IBIX1 to IBIX4 as shown in Figure 12. There may be fewer than 16 input pairs in any RPI installation.
2. Connect the TCM pair for each Base Station to the appropriate TCM terminals. BIX connections are indicated in Table 4.

**Table 4 : Wiring connections**

Input connector	Pin	Signal	Output connector
IBIX 1	1, 2	TCM 1	OBIX 1
	3, 4	TCM 2	OBIX2
	5, 6	TCM 3	OBIX3
	7, 8	TCM 4	OBIX4
IBIX2	1, 2	TCM 5	OBIX5
	3, 4	TCM 6	OBIX6
	5, 6	TCM 7	OBIX7
	7, 8	TCM 8	OBIX8
IBIX3	1, 2	TCM 9	OBIX9
	3, 4	TCM 10	OBIX10
	5, 6	TCM 11	OBIX11
	7, 8	TCM 12	OBIX12
IBIX4	1, 2	TCM 13	OBIX13
	3, 4	TCM 14	OBIX14
	5, 6	TCM 15	OBIX15
	7, 8	TCM 16	OBIX16

### Output connections

3. Feed the TCM output pairs in through the bottom of the RPI as shown in Figure 12 (see Figure 14 for a close-up of the pinout connection) and

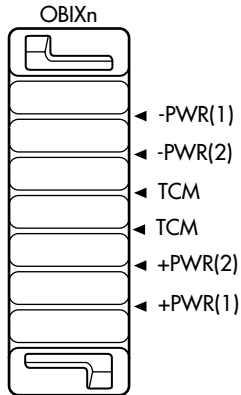
route the pairs to the output connectors. If only one pair is used for powering a Base Station, connect the power pair to -PWR(1) and +PWR(1). If two pairs are used to power a Base Station, connect one pair to -PWR(1) and +PWR(1), and the second pair to -PWR(2) and +PWR(2).

**WARNING!**

**Ensure both power pairs have the same polarity.**

Connecting two power pairs with opposing polarities may damage the Base Station and RPI.

**Figure 14 : BIX output connector pinout**



4. Connect the dc power pair for each Base Station to the power terminals on the same connector as in “Upgrading an RPI-8 to an RPI-16.”



**WARNING!**

**Do not power up the RPI until the installation is complete, including the installation of Base Station cross-connectors.**

If you are adding extra lines for Base Stations, always power down the RPI before you begin.



## Upgrading an RPI-8 to an RPI-16

### ATTENTION!

Only distributors and authorized service personnel are permitted to upgrade an RPI-8.

The RPI-8 BIX UL, which has only one power supply unit, has grounding straps and plates fitted so it can be upgraded to an RPI-16 BIX UL (see Figure 9 on page 21).

1. Power down the RPI.
2. Unscrew the grounding straps and plates.
3. Add the second power supply unit and screw down the grounding straps, the grounding plates and the power supply unit.
4. Plug the output of the power supply unit into the connector board.
5. Connect the jumper lead from PSU 1 to the lead from PSU 2.
6. Power up the RPI.

**Note:** The dc power supply passes through the clip and strain relief support, as shown in Figure 9 on page 21, before connecting to the terminal block by 16 AWG wire.

### ATTENTION!

**The RPI unit should have the dc backup power supplied by a CSA listed UPS.**

The UPS should have an output voltage rating of 44 to 50 V dc, with a maximum fault current limit of 6 A to protect the RPI's output wiring. Otherwise, it may be necessary to use class 1 wiring.

## Mounting a Base Station plug-top power supply

1. Fasten the bracket into position using two 4 cm screws.
2. Route the power supply cord through the bottom (or top) opening and under the strain relief of the bracket.
3. Route the telephone cable from the distribution block through the top (or bottom) opening.
4. Wind any excess telephone cable around the posts to secure it, then fasten it under the strain relief.
5. Connect the cable wires to the BIX connector on the termination board as shown in Figure 4 on page 15.
6. Mount the Base Station onto the bracket, snapping it into position.
7. Connect the power RJ11 jumper lead to the RJ11 jacks on the termination board and the Base Station.
8. Connect the power supply connector to the Base Station power connector.



### **WARNING!**

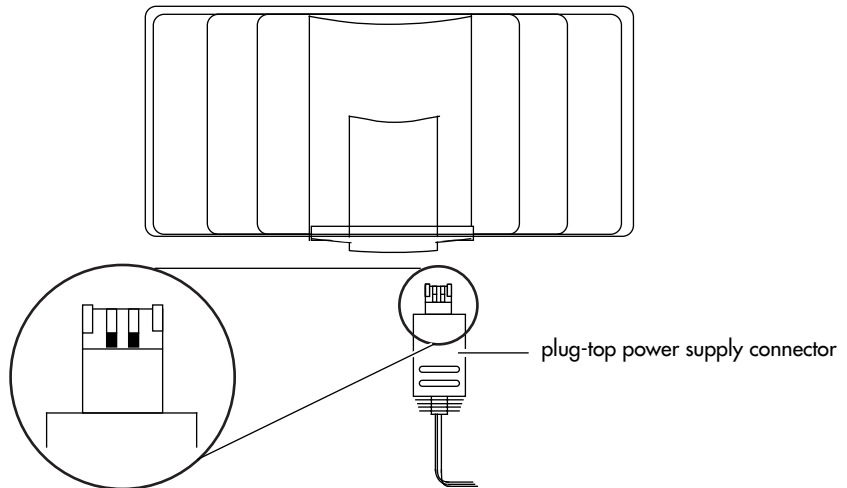
**Inserting the power supply connector in the wrong direction may damage the plug-top power supply and the Base Stations.**

Position the power supply connector in the proper direction and push it into place securely (see Figure 15).



### **CAUTION!**

The Base Station should only be powered up with a class 2 plug-top power source.

**Figure 15 : Plug-top power supply connector**

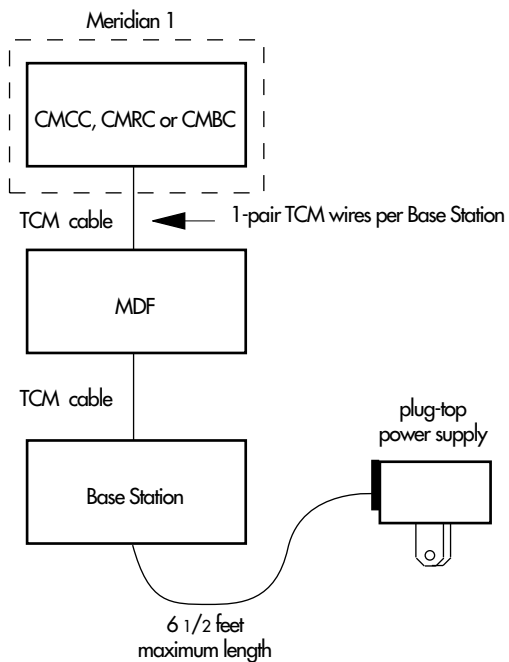
9. Plug the power supply into the AC outlet. The green light turns on and the red light flashes (if not, see “Troubleshooting a Base Station” on page 169).
10. Record the associated port number in the space provided on the printed label affixed on the lower right corner of the mounting bracket.

**Note:** Include the labeling information for each Base Station on the completed installation floor plans and the *Meridian Companion Programming and Provisioning Record* for reference.

11. Slide the cover onto the bracket, using the guide to position it properly. Snap the cover into place.

Figure 16 shows a configuration for small installations in which the Base Station is located near an existing AC power source or the Base Station is farther from an RPI unit than 800 m.

**Figure 16 : Base Station local power**



## Installing external antennas and lightning surge arrestors

There are three types of external antennas:

- indoor directional
- indoor omnidirectional
- outdoor omnidirectional

There are separate installation procedures for each type. You need to install a lightning surge arrestor for each outdoor omnidirectional external antenna, which is not included with this type of external antenna.

### Installation requirements

- If installing an external antenna on a metal surface greater than 18 cm in diameter, position the antenna perpendicular to the surface.
- Always ensure that the antenna is clear of any adjacent obstruction, particularly metal. If more than one external antenna is used at a cell center, the antennas should be spaced at least 0.5 m from each other to avoid radio interference problems.
- When running the coaxial cable inside or outside, take care not to kink, stretch, or crush the cable as which will seriously affect its performance. The minimum recommended bending radius is 20 mm.
- Use RG-58/U coaxial cables to connect the antennas to the Base Stations..

### **ATTENTION!**

**Only passive antennas may be connected to the Companion Base Stations.**

The coaxial cable connecting the external antenna to a Companion Base Station must have an impedance of 50 ohms.

## ATTENTION!

Do not install the external antenna or the lightning surge arrestor during an electrical storm.

Always turn off the Base Station power before connecting the coaxial cable of an outdoor external antenna.

Always install the lightning surge arrestor as close as possible to the cable entry point into the building.

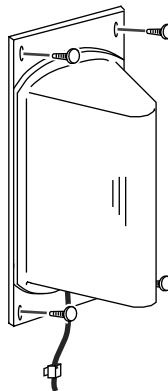
Connect the lightning surge arrestor to ground before connecting the coaxial cable.

## Installing an indoor directional external antenna

The indoor directional external antenna comes with its own back plate for mounting. The recommended mounting height on a wall is halfway between the floor and the ceiling.

**Note:** For some applications (for example, a stairwell), it is possible to mount the antenna on the ceiling.

**Figure 1: Indoor directional external antenna**



1. Mount the antenna using four screws.
2. To prevent undue stress on the coaxial cable, secure it to the mounting surface.
3. Connect the antenna to the appropriate Base Station radio.

**Note:** The coaxial cable length must not exceed 10 m.

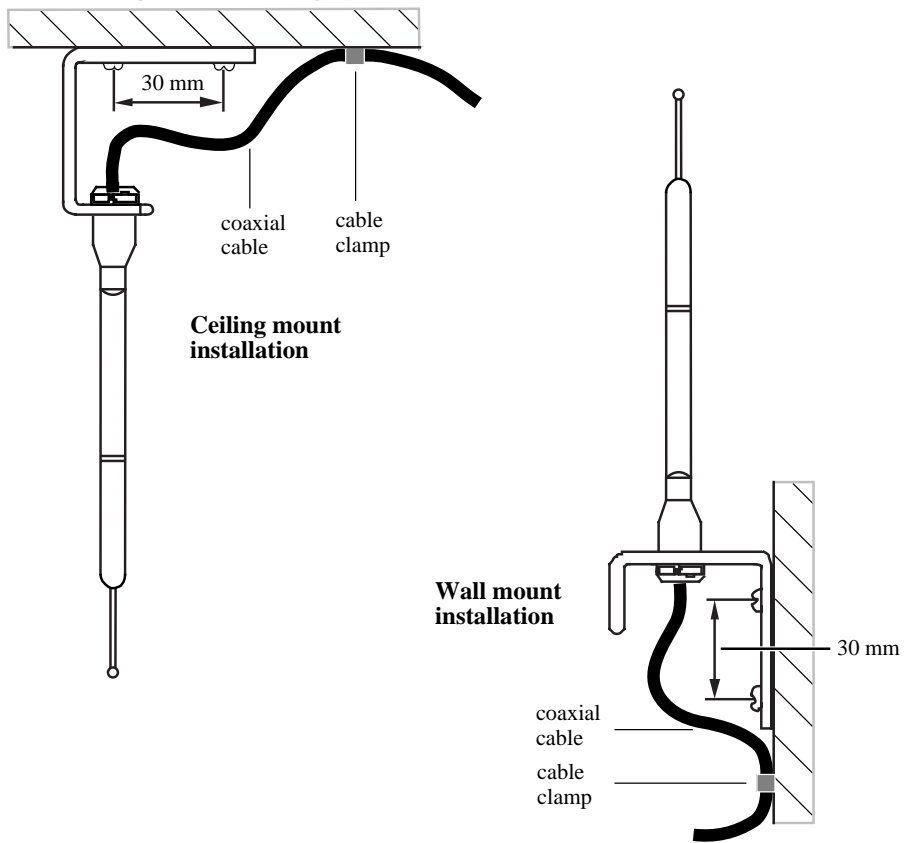
### **Installing an indoor omnidirectional external antenna**

- Use the bracket supplied to mount the antenna on a wall or ceiling.

**Note:** Use of a bracket other than the one supplied may not provide the necessary clearance between the floor or wall and the antenna.

- Install the bracket so that the external antenna is vertical. The recommended mounting height on a wall is halfway between the floor and the ceiling.

**Figure 2: Installing an indoor omnidirectional external antenna**



1. Insert the antenna in the bracket so that the antenna is vertical.
2. Mount the bracket to the wall or ceiling using two screws.
3. To prevent undue cable stress on the coaxial cable, secure it to the mounting surface with a clamp.
4. Connect the external antenna to the appropriate Base Station radio.

**Note:** The length of the coaxial cable must not exceed 10 m.



## Installing an outdoor omnidirectional external antenna

- Locate the antenna on the external wall of the building.

**Note:** The antenna must be mounted on a vertical surface.

- Keep the outdoor omnidirectional external antenna as close as possible to the Base Station serving it (the Base Station must be inside). The recommended mounting height is 4 to 5 m above ground level.
- Always install a lightning surge arrestor between an outdoor omnidirectional antenna and a Base Station.

**Note:** The connector on the outdoor omnidirectional antenna is a TNC female connector, so you need an adapter to connect it to the standard BNC coaxial cables needed for the lightning surge arrestor and the Base Station. You can also use a coaxial cable with a TNC male connector on one end and BNC male connector on the other end.

### **ATTENTION!**

**Fit the lightning protection to the antenna if appropriate.**

See “Installing a lightning surge arrestor.”

### **ATTENTION!**

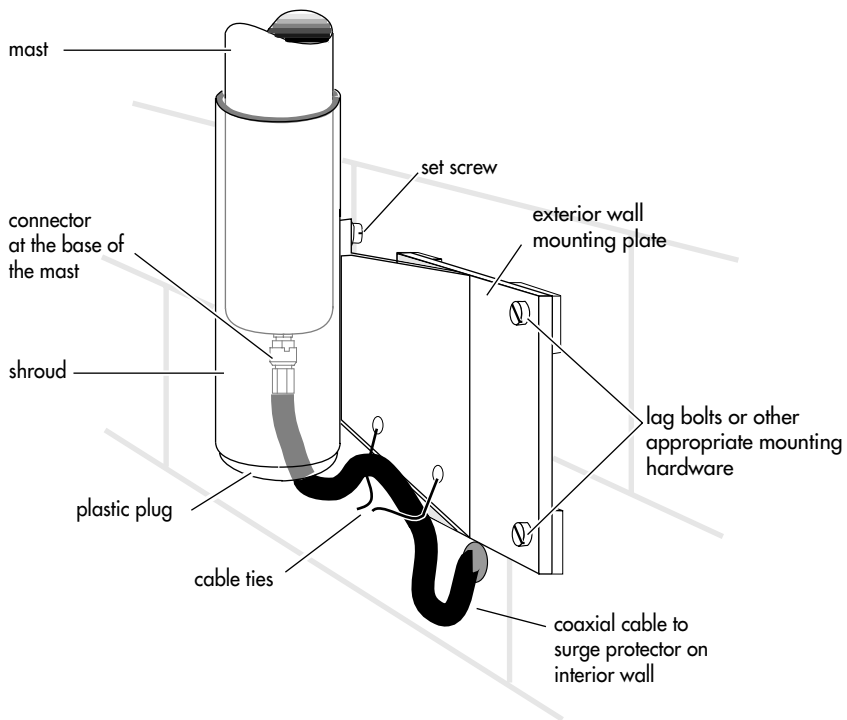
Do not install the external antenna or the lightning surge arrestor during an electrical storm.

Always turn off the Base Station power before connecting the coaxial cable of an outdoor external antenna.

Always install the lightning surge arrestor as close as possible to the cable entry point into the building.

Connect the lightning surge arrestor to ground before connecting the coaxial cable

**Figure 9: Installing the outdoor omnidirectional external antenna**



1. Screw the antenna mounting plate vertically to the exterior wall of the building with lag bolts or other appropriate hardware as shown in Figure 9.
2. Feed one end of the coaxial cable up through the bottom of the antenna shroud and attach the BNC connector to the base of the mast.
3. Slide the mast down into the shroud until it fits.
4. Rotate the mast until the threaded hole in the base of the mast is aligned with the set screw hole in the shroud, and then tighten the set screw.
5. Route the coaxial cable along the bottom edge of the plate between the shroud and the wall plate and tie the cable up.

**Note:** The total length of the coaxial cables from the outdoor external antenna to the Base Station must not exceed 10 m.

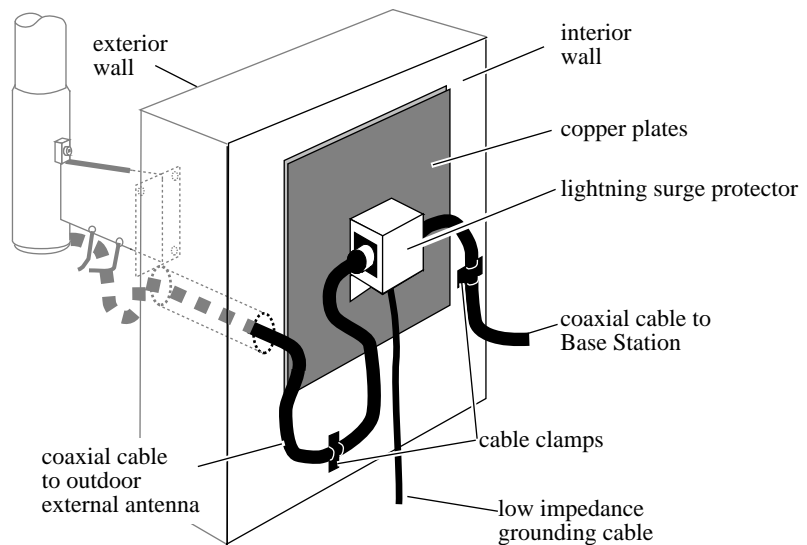
6. Insert the protective plastic plug into the base of the shroud.
7. Feed the coaxial cable through the wall to the lightning surge arrester on the interior wall.

## Installing the lightning surge arrester

Install the lightning surge arrester for the outdoor omnidirectional antenna to protect it from electrical surges. The recommended lightning surge arrester is part number A0382082. Refer to the manufacturer's installation instructions for more details on its installation.

1. Mount the lightning surge arrester on the interior wall, shown in Figure 10, as close as possible to the entry point of the coaxial cable from the outdoor external antenna. Follow the installation instructions that come with the lightning surge arrester.

**Figure 10: Installing the lightning surge arrester**



2. Before you connect the ground lead to the lightning surge arrester, attach it to an approved ground. The recommended wire gauge is 6 AWG (4 mm). Connect the ground lead to the building ground. *Do not connect to a ground rod or series of ground rods.* If you cannot connect the

ground lead to the building ground, connect it to the building's steel (the connection should be no more than two to three meters. You can also connect the ground lead to the 120 VAC conduit (which is connected to the building ground), but this is *not* a preferred solution.

3. Route and connect the coaxial cable from the outdoor external antenna to the lightning surge arrester.
4. Route and connect the coaxial cable from the lightning surge arrester to the appropriate Base Station BNC connector.

**Note:** The total length of the coaxial cables from the outdoor external antenna to the Base Station must not exceed 10 m.

## Installing a Companion Administration Terminal

The Companion Administration Terminal is connected to the first Companion Meridian Controller card (CMCC) Time Compression Multiplexing (TCM) port. It cannot make or receive telephone calls, but is used to program the Meridian Companion system and the portable telephones.

**Note:** If you plan to use Companion Manager instead of or in addition to an Administration Terminal, refer to *Companion Manager Installation and Operations Guide*.

### Installing the Administration Terminal

1. Remove the Administration Terminal from its box.  
For wall mounting instructions, see "Mounting an Administration Terminal on the wall" on page 43.
2. Do not attach the receiver. (You may want to discard it because the Administration Terminal cannot be used as a telephone.)
3. Connect one end of the telephone cord to the back of the Administration Terminal and the other end to the port on the distribution block that corresponds to the first port on the CMCC.
4. Replace the four buttons below the display with the navigation button caps provided with the set.

## Mounting an Administration Terminal on the wall

1. Remove the wall mounting bracket from the base of the Administration Terminal. Grip the base and, with both thumbs push up on the mounting bracket to pop it out.
2. Use a screwdriver or similar tool to remove the center knock-out panel from the base.
3. With the thin end up, hold the mounting bracket against the wall and mark the positions of the three fixing screws.
4. Route the line cord along the guide in the base and through the knocked out hole.
5. Screw the mounting bracket to the wall.
6. Connect the line cord to the jack in the base of the Administration Terminal.
7. Tuck the spare cable into the base.
8. Plug the Administration Terminal into the first port on the CMCC.
9. Snap the Administration Terminal onto the base.

## Installing Companion Manager

You can use Companion Manager instead of or in addition to the Administration Terminal. For installation instructions, refer to *Companion Manager Installation and Operations Guide*. If you are running Companion Diagnostic Software (CDS) or Companion Manager on a PC, a Remote Access Device (RAD) must be installed.

## Installing the PC Interface Card

The PCI card provides a physical connection between the Companion Controller and your PC. The PCI card communicates with the PC through an Input/Output port. This I/O port is a 16 byte area in PC memory between addresses 200 and 3F0(hex). The starting address of the I/O port is called the I/O base address.

The I/O base address and IRQ settings are in file `waccess.ini`, which is located in your windows root directory (usually `c:\windows`). On startup,

PCconfig backs up the existing `waccess.ini` file by renaming it `waccess.old`. If you have complex `waccess.ini` file contents (for example, TAPI or ACCESS), you should manually back up the file before running PCconfig.

The configuration tool verifies that the I/O base address and the IRQ selected for the PCI card are properly configured, and that the card is properly connected to the Controller.

**Note:** The configuration tool runs only on Windows 95® and Windows 3.1®.

## Setting the base address dip switches

The I/O base address is set using the five dip switches on the PCI card. You must select a setting that does not conflict with other hardware connected to your PC. If you are running Windows 95, you can view the I/O base address settings:

1. Press START and select Settings/Control Panel.
2. Double-click on the System icon to open the System Properties.
3. Select the Device Manager tab and press the Properties button.
4. Select the Input/output radio button.
5. Scroll through the list and ensure there is no conflict with the I/O addresses. Change the I/O base address settings on the card when there is a conflict.

You should initially set the dip switches to correspond to the I/O base address of 280h [ON,OFF,ON,ON,ON].

If you are running Windows 3.1 and you cannot view the I/O address settings, the best range of addresses is 230h to 300h.

Do not use 2F0h and 3F0h addresses. PC COMM1 AND COMM2 serial ports use addresses 2F8h and 3F8h.

On older PCI cards, the default dip switch settings correspond to I/O base address 300h. Address 300h may not work when you are running Windows 95.

**Table 5 : Dip switch settings**

I/O address	1	2	3	4	5
200	ON	ON	ON	ON	ON
210	ON	ON	ON	ON	OFF
220	ON	ON	ON	OFF	ON
230	ON	ON	ON	OFF	OFF
240	ON	ON	OFF	ON	ON
250	ON	ON	OFF	ON	OFF
260	ON	ON	OFF	OFF	ON
270	ON	ON	OFF	OFF	OFF
280	ON	OFF	ON	ON	ON
290	ON	OFF	ON	ON	OFF
2A0	ON	OFF	ON	OFF	ON
2B0	ON	OFF	ON	OFF	OFF
2C0	ON	OFF	OFF	ON	ON
2D0	ON	OFF	OFF	ON	OFF
2E0	ON	OFF	OFF	OFF	ON
2F0	ON	OFF	OFF	OFF	OFF
300	OFF	Same as 200s section			
.	OFF				
.					
.					
3F0	OFF				

## Installing the PCI card



### CAUTION!

**Do not use a pencil to change the switch settings. Graphite deposits are electrically conductive and can cause a short circuit in the switch.**

1. Set the five dip switches for the I/O base address you are using.
2. Power off the PC and remove the cover.
3. Insert the card in a free expansion slot.
4. Replace the cover.
5. Run a Teledapt cable from the card's LINE jack to the Controller.
6. Power up the PC.

## Setting the hardware interrupt

The PCI card requires a hardware interrupt (IRQ) in the range of 3 to 7 that is not in use by another device on your PC.

**Table 6 : PC hardware and IRQ settings**

IRQ	Use	
3	Serial port COMM2	may be available
4	Serial port COMM1	may be available
5	Sound card, LAN, ...	often available
6	Floppy drive controller	unavailable
7	Printer LPT1	often available

The configuration tool shows you the available IRQ settings, and allows you to choose the IRQ setting for the PCI card.



**Note:** Ensure that an IRQ setting is available before selecting it. If equipment connected to your PC is turned off, is not currently active, or if a driver is not running, the IRQ setting may appear as available.

For example, you may select IRQ7 for the PCI card, but a printer may be using IRQ7. You may not be able to print a file when the PCI application is active.

If an IRQ is not available in the range 3 to 7, you may be able to reconfigure equipment to use a higher IRQ setting. If you are running Windows 95, you can view the equipment and the IRQ setting:

1. Press START and select Settings/Control Panel.
2. Double-click on the System icon to open the System Properties.
3. Select the Device Manager tab and press the Properties button.
4. Select the Interrupt request radio button.

**Note:** Older equipment may not show up in this list.

For more information on installing the PCI card, refer to PCconfig on-line help.

## Installing a Remote Access Device

Refer to *Companion Remote Access Device Installation Guide*.

## RAD configuration options

The configuration in Figure 17 permits local or remote access to the Meridian Companion system.

**Figure 17 : Local or remote access to Meridian Companion**

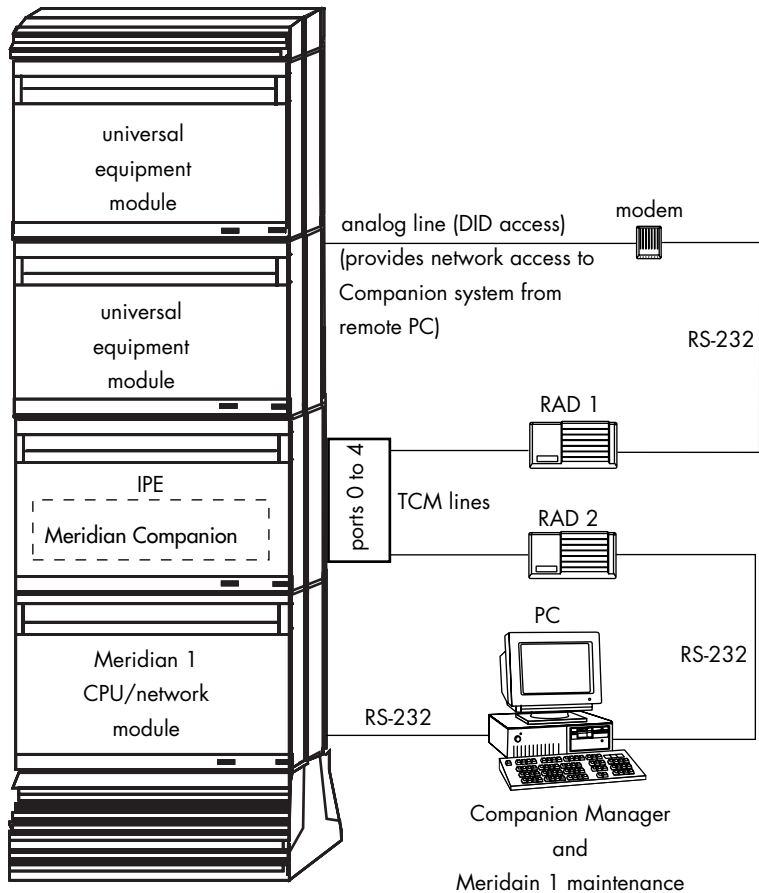


Figure 18 shows how to configure the PC when the PC handles Meridian 1 maintenance as well as Meridian Companion diagnostic software. The PC connects directly to the Meridian 1 system and connects to Companion through the RAD. In this configuration, the PC must have three serial ports to support the RAD, the mouse, and the Meridian 1 CPU.

**Figure 18 : Local access to shared Meridian Companion PC**

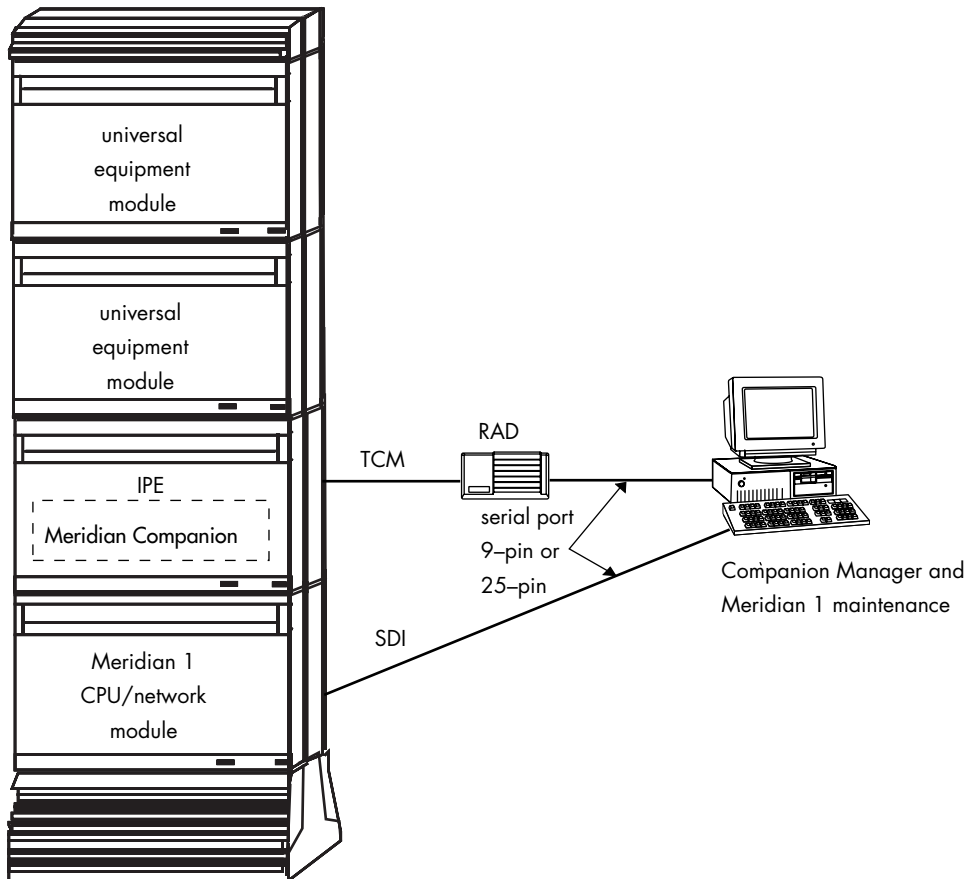
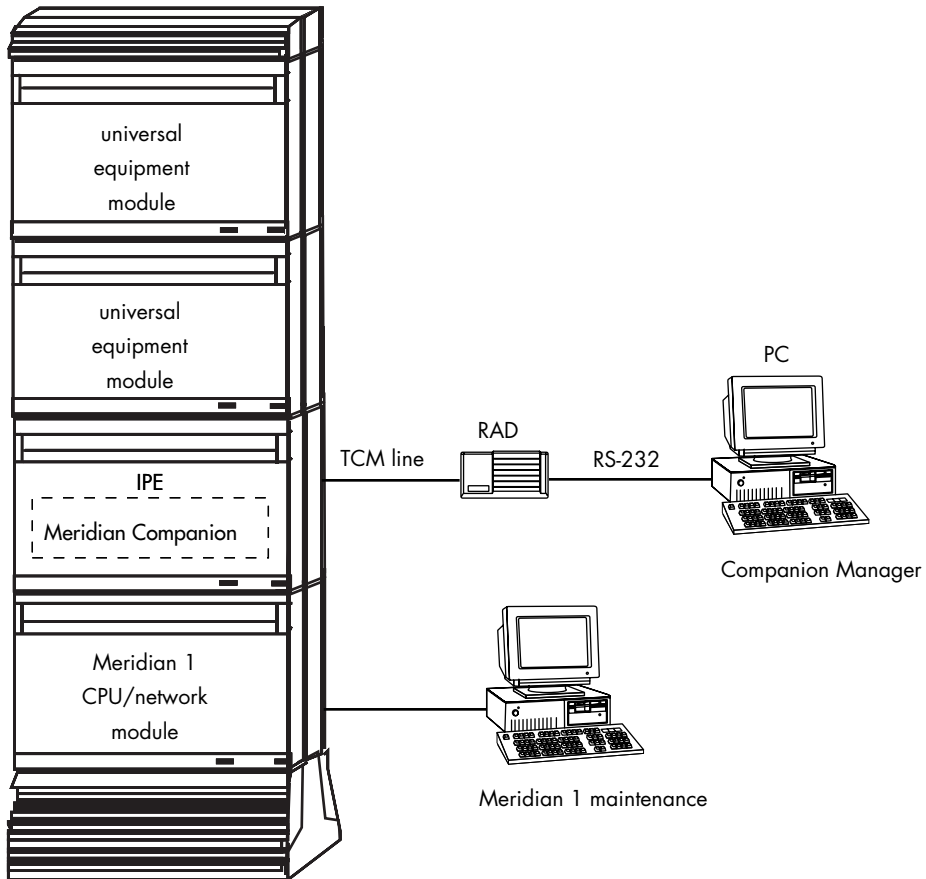


Figure 19 shows local access to Meridian Companion using a PC dedicated to Meridian Companion. In this case, the PC running the diagnostics connects directly to the RAD.

**Figure 19 : Local access to dedicated Meridian Companion PC**



## **Wiring the Time Compression Multiplexing lines**

The Base Stations, the Administration Terminal, and the RAD connect to the Meridian Companion cards using twisted pairs called Time Compression Multiplexing (TCM) lines.

The TCM lines on the CMCC or Companion Meridian radio line cards (CMRC) or Companion Meridian Base Station cards (CMBC) are available at the backplane on tip and ring pairs.

## **Planning the IPE and CE/PE Module wiring**

Tables 7 through 13 show the configuration for IPE Modules and IPE slots on CE/PE Modules. Refer to the Meridian 1 system installation procedures for more information.

**Table 7 : NT8D11 CE/PE Module—Line card pair-terminations with backplane cable expansion**

Pair	Pins	Pair color	I/O panel connector cables/slots										Unit 24/card
			A	B	C	D	E	F	G	H	K	L	
			0	1	2	3	4	5	6	7	8	9	
1T / 1R	26 / 1	W-BL / BL-W											0
2T / 2R	27 / 2	W-O / O-W											1
3T / 3R	28 / 3	W-G / G-W											2
4T / 4R	29 / 4	W-BR / BR-W											3
5T / 5R	30 / 5	W-S / S-W											4
6T / 6R	31 / 6	R-BL / BL-R											5
7T / 7R	32 / 7	R-O / O-R											6
8T / 8R	33 / 8	R-G / G-R											7
9T / 9R	34 / 9	R-BR / BR-R											8
10T / 10R	35 / 10	R-S / S-R											9
11T / 11R	36 / 11	BK-BL / BL-BK											10
12T / 12R	37 / 12	BK-O / O-BK											11
13T / 13R	38 / 13	BK-G / G-BK											12
14T / 14R	39 / 14	BK-BR / BR-BK											13
15T / 15R	40 / 15	BK-S / S-BK											14
16T / 16R	41 / 16	Y-BL / BL-Y											15
17T / 17R	42 / 17	Y-O / O-Y											16
18T / 18R	43 / 18	Y-G / G-Y											17
19T / 19R	44 / 19	Y-BR / BR-Y											18
20T / 20R	45 / 20	Y-S / S-Y											19
21T / 21R	46 / 21	V-BL / BL-V											20
22T / 22R	47 / 22	V-O / O-V											21
23T / 23R	48 / 23	V-G / G-V											22
24T / 24R	49 / 24	V-BR / BR-V											23
25T / 25R	50 / 25	V-S / S-V											Spare

**Table 8 :NTAK 11 and NTAk 12 series main and expansion cabinet wiring**

Pair	Pins	Pair color	J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	Unit 24/ card	
			J11	J12	J13	J14	J15	J16	J17	J18	J19	J20		
			slot											
			1/ 11/21	2/ 12/22	3/ 13/23	4/ 14/24	5/ 15/25	6/ 16/26	7/ 17/27	8/ 18/28	9/ 19/29	10/ 20/30		
1T / 1R	26 / 1	W-BL / BL-W											0	
2T / 2R	27 / 2	W-O / O-W											1	
3T / 3R	28 / 3	W-G / G-W											2	
4T / 4R	29 / 4	W-BR / BR-W											3	
5T / 5R	30 / 5	W-S / S-W											4	
6T / 6R	31 / 6	R-BL / BL-R											5	
7T / 7R	32 / 7	R-O / O-R											6	
8T / 8R	33 / 8	R-G / G-R											7	
9T / 9R	34 / 9	R-BR / BR-R											8	
10T / 10R	35 / 10	R-S / S-R											9	
11T / 11R	36 / 11	BK-BL / BL-BK											10	
12T / 12R	37 / 12	BK-O / O-BK											11	
13T / 13R	38 / 13	BK-G / G-BK											12	
14T / 14R	39 / 14	BK-BR / BR-BK											13	
15T / 15R	40 / 15	BK-S / S-BK											14	
16T / 16R	41 / 16	Y-BL / BL-Y											15	
17T / 17R	42 / 17	Y-O / O-Y											16	
18T / 18R	43 / 18	Y-G / G-Y											17	
19T / 19R	44 / 19	Y-BR / BR-Y											18	
20T / 20R	45 / 20	Y-S / S-Y											19	
21T / 21R	46 / 21	V-BL / BL-V											20	
22T / 22R	47 / 22	V-O / O-V											21	
23T / 23R	48 / 23	V-G / G-V											22	
24T / 24R	49 / 24	V-BR / BR-V											23	
25T / 25R	50 / 25	V-S / S-V											Spare	

**Table 9 : NT8D37 IPE Module—Line card pair-terminations with backplane cable expansion, segments 0 and 1**

Pair	Pins	Pair color	I/O panel connector cables/slots								Unit 24/card
			A	B	C	D	E	F	G	H	
			0	1	2	3	4	5	6	7	
1T / 1R	26 / 1	W-BL / BL-W									0
2T / 2R	27 / 2	W-O / O-W									1
3T / 3R	28 / 3	W-G / G-W									2
4T / 4R	29 / 4	W-BR / BR-W									3
5T / 5R	30 / 5	W-S / S-W									4
6T / 6R	31 / 6	R-BL / BL-R									5
7T / 7R	32 / 7	R-O / O-R									6
8T / 8R	33 / 8	R-G / G-R									7
9T / 9R	34 / 9	R-BR / BR-R									8
10T / 10R	35 / 10	R-S / S-R									9
11T / 11R	36 / 11	BK-BL / BL-BK									10
12T / 12R	37 / 12	BK-O / O-BK									11
13T / 13R	38 / 13	BK-G / G-BK									12
14T / 14R	39 / 14	BK-BR / BR-BK									13
15T / 15R	40 / 15	BK-S / S-BK									14
16T / 16R	41 / 16	Y-BL / BL-Y									15
17T / 17R	42 / 17	Y-O / O-Y									16
18T / 18R	43 / 18	Y-G / G-Y									17
19T / 19R	44 / 19	Y-BR / BR-Y									18
20T / 20R	45 / 20	Y-S / S-Y									19
21T / 21R	46 / 21	V-BL / BL-V									20
22T / 22R	47 / 22	V-O / O-V									21
23T / 23R	48 / 23	V-G / G-V									22
24T / 24R	49 / 24	V-BR / BR-V									23
25T / 25R	50 / 25	V-S / S-V									Spare



**Table 10 : NT8D11 CE/PE Module—Line card pair-terminations for connectors A, B, E, H (standard)**

Pair	Pins	Pair color	I/O panel connectors/slot				Unit 16/card
			A	B	E	H	
			slot 0	slot 1	slot 4	slot 7	
1T / 1R	26 / 1	W-BL / BL-W					0
2T / 2R	27 / 2	W-O / O-W					1
3T / 3R	28 / 3	W-G / G-W					2
4T / 4R	29 / 4	W-BR / BR-W					3
5T / 5R	30 / 5	W-S / S-W					4
6T / 6R	31 / 6	R-BL / BL-R					5
7T / 7R	32 / 7	R-O / O-R					6
8T / 8R	33 / 8	R-G / G-R					7
9T / 9R	34 / 9	R-BR / BR-R					8
10T / 10R	35 / 10	R-S / S-R					9
11T / 11R	36 / 11	BK-BL / BL-BK					10
12T / 12R	37 / 12	BK-O / O-BK					11
13T / 13R	38 / 13	BK-G / G-BK					12
14T / 14R	39 / 14	BK-BR / BR-BK					13
15T / 15R	40 / 15	BK-S / S-BK					14
16T / 16R	41 / 16	Y-BL / BL-Y					15
				slot 2	slot 5	slot 8	
17T / 17R	42 / 17	Y-O / O-Y					0
18T / 18R	43 / 18	Y-G / G-Y					1
19T / 19R	44 / 19	Y-BR / BR-Y					2
20T / 20R	45 / 20	Y-S / S-Y					3
21T / 21R	46 / 21	V-BL / BL-V					4
22T / 22R	47 / 22	V-O / O-V					5
23T / 23R	48 / 23	V-G / G-V					6
24T / 24R	49 / 24	V-BR / BR-V					7
25T / 25R	50 / 25	V-S / S-V					Spare

**Table 11 : NT8D11 CE/PE Module—Line card pair-terminations for connectors C, F, K (standard)**

Pair	Pins	Pair color	I/O panel connector/slot			Unit 16 per card
			C	F	K	
			slot 2	slot 5	slot 8	
1T / 1R	26 / 1	W-BL / BL-W				8
2T / 2R	27 / 2	W-O / O-W				9
3T / 3R	28 / 3	W-G / G-W				10
4T / 4R	29 / 4	W-BR / BR-W				11
5T / 5R	30 / 5	W-S / S-W				12
6T / 6R	31 / 6	R-BL / BL-R				13
7T / 7R	32 / 7	R-O / O-R				14
8T / 8R	33 / 8	R-G / G-R				15
			slot 3	slot 6	slot 9	
9T / 9R	34 / 9	R-BR / BR-R				0
10T / 10R	35 / 10	R-S / S-R				1
11T / 11R	36 / 11	BK-BL / BL-BK				2
12T / 12R	37 / 12	BK-O / O-BK				3
13T / 13R	38 / 13	BK-G / G-BK				4
14T / 14R	39 / 14	BK-BR / BR-BK				5
15T / 15R	40 / 15	BK-S / S-BK				6
16T / 16R	41 / 16	Y-BL / BL-Y				7
17T / 17R	42 / 17	Y-O / O-Y				8
18T / 18R	43 / 18	Y-G / G-Y				9
19T / 19R	44 / 19	Y-BR / BR-Y				10
20T / 20R	45 / 20	Y-S / S-Y				11
21T / 21R	46 / 21	V-BL / BL-V				12
22T / 22R	47 / 22	V-O / O-V				13
23T / 23R	48 / 23	V-G / G-V				14
24T / 24R	49 / 24	V-BR / BR-V				15
25T / 25R	50 / 25	V-S / S-V				Spare

**Table 12 : NT8D37 IPE Module—Line card pair-terminations for connectors B, F, L, S**

Pair	Pins	Pair color	I/O panel connectors				Unit 16/card
			B	F	L	S	
			slot 1	slot 5	slot 9	slot 13	
1T / 1R	26 / 1	W-BL / BL-W					0
2T / 2R	27 / 2	W-O / O-W					1
3T / 3R	28 / 3	W-G / G-W					2
4T / 4R	29 / 4	W-BR / BR-W					3
5T / 5R	30 / 5	W-S / S-W					4
6T / 6R	31 / 6	R-BL / BL-R					5
7T / 7R	32 / 7	R-O / O-R					6
8T / 8R	33 / 8	R-G / G-R					7
9T / 9R	34 / 9	R-BR / BR-R					8
10T / 10R	35 / 10	R-S / S-R					9
11T / 11R	36 / 11	BK-BL / BL-BK					10
12T / 12R	37 / 12	BK-O / O-BK					11
13T / 13R	38 / 13	BK-G / G-BK					12
14T / 14R	39 / 14	BK-BR / BR-BK					13
15T / 15R	40 / 15	BK-S / S-BK					14
16T / 16R	41 / 16	Y-BL / BL-Y					15
			slot 2	slot 6	slot 10	slot 14	
17T / 17R	42 / 17	Y-O / O-Y					0
18T / 18R	43 / 18	Y-G / G-Y					1
19T / 19R	44 / 19	Y-BR / BR-Y					2
20T / 20R	45 / 20	Y-S / S-Y					3
21T / 21R	46 / 21	V-BL / BL-V					4
22T / 22R	47 / 22	V-O / O-V					5
23T / 23R	48 / 23	V-G / G-V					6
24T / 24R	49 / 24	V-BR / BR-V					7
25T / 25R	50 / 25	V-S / S-V					Spare

**Table 13 : NT8D37 IPE Module—Line card pair-terminations for connectors C, G, M, T**

Pair	Pins	Pair color	I/O panel connectors				Unit 16/card
			C	G	M	T	
			slot 2	slot 6	slot 10	slot 14	
1T / 1R	26 / 1	W-BL / BL-W					8
2T / 2R	27 / 2	W-O / O-W					9
3T / 3R	28 / 3	W-G / G-W					10
4T / 4R	29 / 4	W-BR / BR-W					11
5T / 5R	30 / 5	W-S / S-W					12
6T / 6R	31 / 6	R-BL / BL-R					13
7T / 7R	32 / 7	R-O / O-R					14
8T / 8R	33 / 8	R-G / G-R					15
			slot 3	slot 7	slot 11	slot 15	
9T / 9R	34 / 9	R-BR / BR-R					0
10T / 10R	35 / 10	R-S / S-R					1
11T / 11R	36 / 11	BK-BL / BL-BK					2
12T / 12R	37 / 12	BK-O / O-BK					3
13T / 13R	38 / 13	BK-G / G-BK					4
14T / 14R	39 / 14	BK-BR / BR-BK					5
15T / 15R	40 / 15	BK-S / S-BK					6
16T / 16R	41 / 16	Y-BL / BL-Y					7
17T / 17R	42 / 17	Y-O / O-Y					8
18T / 18R	43 / 18	Y-G / G-Y					9
19T / 19R	44 / 19	Y-BR / BR-Y					10
20T / 20R	45 / 20	Y-S / S-Y					11
21T / 21R	46 / 21	V-BL / BL-V					12
22T / 22R	47 / 22	V-O / O-V					13
23T / 23R	48 / 23	V-G / G-V					14
24T / 24R	49 / 24	V-BR / BR-V					15
25T / 25R	50 / 25	V-S / S-V					Spare

## Installing Meridian Companion cards



### **STATIC!**

**Wear a grounding strap.**

Do not touch the printed circuit board or the connector. The printed circuit board is a static-sensitive device.

Meridian Companion includes five different types of cards:

- a required Companion Meridian Controller card (CMCC)
- optional Companion Meridian radio line cards (CMRC)
- optional Companion Meridian line cards (CMLC)
- optional Companion Meridian base station cards (CMBC)
- a required ROM feature card, which is a daughter board of the Controller card (CMCC)

If a new IPE Module is required, make sure that it has been installed and powered up before installing the Meridian Companion system.

Keep these points in mind when installing cards:

**Note:** When you install a CMBC card connect at least one Base Station to it before you power on the system to prevent a **Config ambiguous** alarm

- The cards must all reside on a single IPE Module.
- The cards must be grouped in adjacent slots on the IPE Module (or IPE slots on the CE/PE Module).
- The CMCC can be installed anywhere on the IPE Module, but it must be located to the left of the other Companion cards.
- Any Companion expansion cards must be installed, in any order, to the right of the CMCC, and must be installed before installing the CMCC.
- The cards should be installed and connected from right to left. The CMCC is the last card to be installed and connected.

- Activating octal density with the MC32 feature density doubles the WTN capacity of the CMCC, CMRC, and CMLC cards
- When installing cards into an Option 11 core or expansion cabinet, note the actual slot location of the CMCC. You will need to verify this location when programming the system (see “CMCC slot” on page 84 for more information).

### **ATTENTION!**

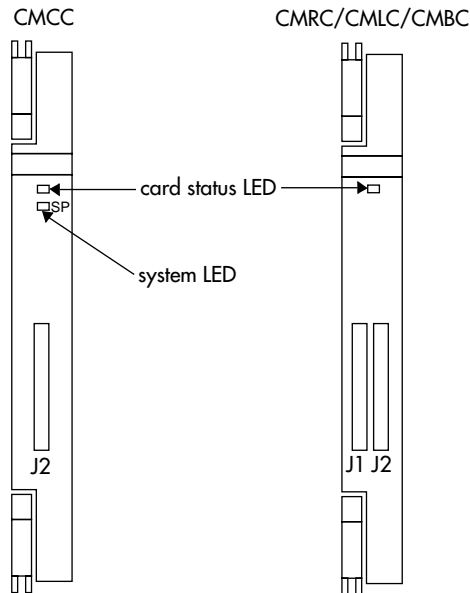
**If the card slot address requires an adjustment and you do not make this adjustment, the WTN addresses will not be consistent with the M1 addresses.**

Faceplate 60-wire cabling connects the CMCC to the other cards in a daisychain. A long faceplate cable (bypass faceplate cable harness) is available to connect cards across the NT8D01 Controller card if necessary.

## **Normal LED behavior upon installation**

All Companion cards are equipped with a card status LED. The CMCC is also equipped with a system LED, labelled SP (system processor).

The card LED is the top LED on the CMCC and the only LED on the expansion cards. It is not labeled on any cards. If the LED is on, the card is out of service and can be safely removed. If the LED is off, the card is in service and should not be removed. The difference between a regular line card and a Meridian Companion card is that the Meridian Companion card must be disabled from *both the Meridian 1 and the Meridian Companion sides* before the LED goes from *off* to *on*. Conversely, for a completely disabled card (LED is on) the LED goes off instantly when the card is enabled from either side.

**Figure 20 : Card LED locations**

When the card is first installed or powered up, the LED goes on for approximately 3 seconds, then flashes three times to indicate that the firmware self-test sequence is operating properly. If the LED does not follow this pattern, the card is defective and must be replaced.

The system LED is the bottom LED on the CMCC. It indicates the status of the Controller software. Its state affects the state of all other cards. When the CMCC is first installed, the system LED does the following:

- Does not flash but remains on for approximately 5 seconds.
- Goes off for approximately 5 seconds.
- Begins flashing to indicate that connected cards and TCM devices are initializing.

If this normal pattern (on/off/flashing) does not occur, refer to “Normal card LED behavior” on page 166. LED behavior following initialization depends on whether the CMCC has been programmed and whether expansion cards have been connected, as described in Table 39: Card LED behavior, on page 167.

## Placing the cards

Figure 21 shows how cards appear on the IPE Module in Option 21 through Option 81 systems.

**Figure 21 : IPE Module—Meridian Companion possible placement of cards**

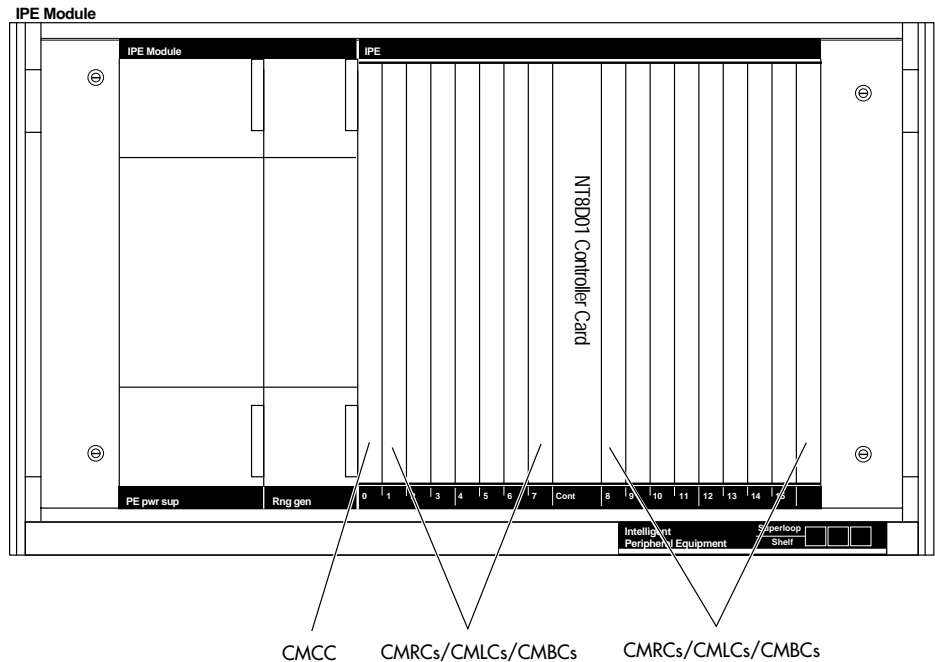




Figure 22 shows the card configuration on a CE/PE Module. The illustration lists other cards that can be located on the CE/PE Module.

**Figure 22 : CE/PE Module—Meridian Companion possible placement of cards**

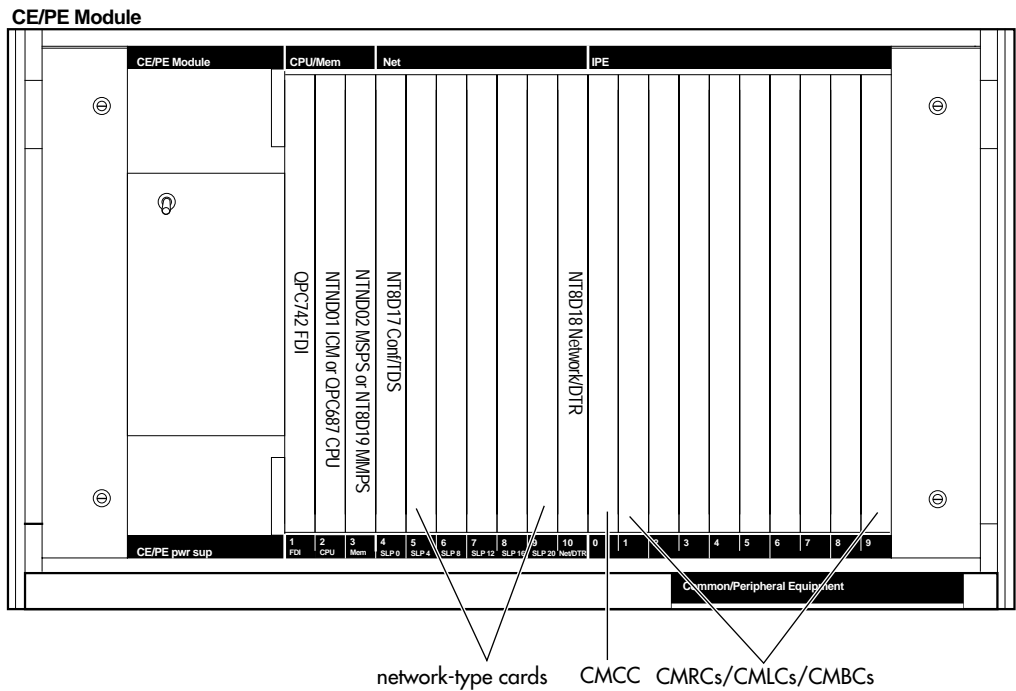


Figure 23 and Figure 24 show card placement in Option 11 systems. The cards can be placed in slots 1 through 9 on the system shelf, as shown in Figure 23, or in an expansion cabinet, as shown in Figure 24. Option 11 systems that are not using Meridian Mail can also install a Companion card in slot 10. The illustrations indicate the kinds of cards that can be included in the Option 11 system.

**Figure 23 : Option 11 Meridian Companion card configuration—Main cabinet**

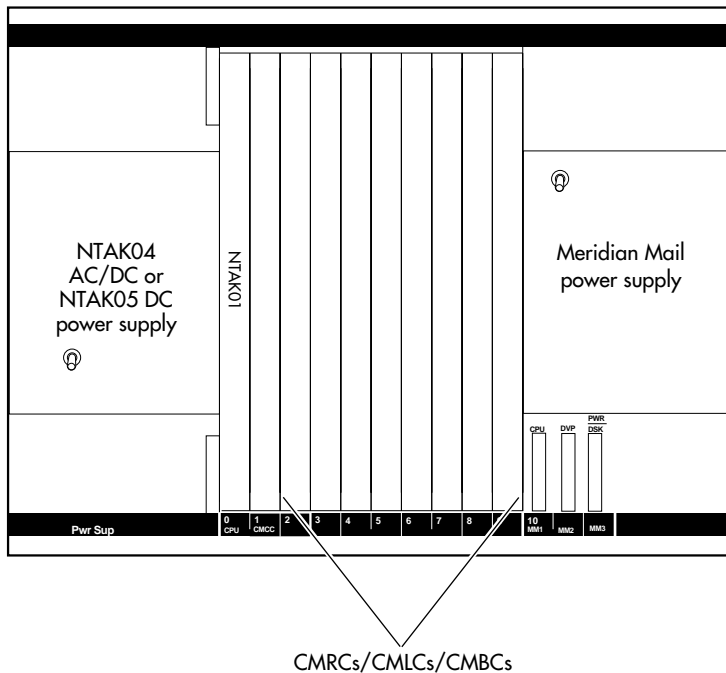
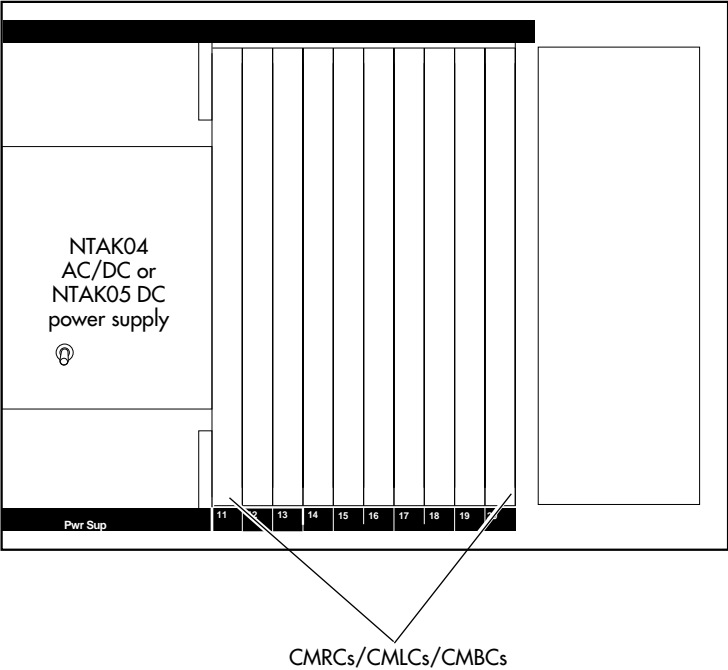
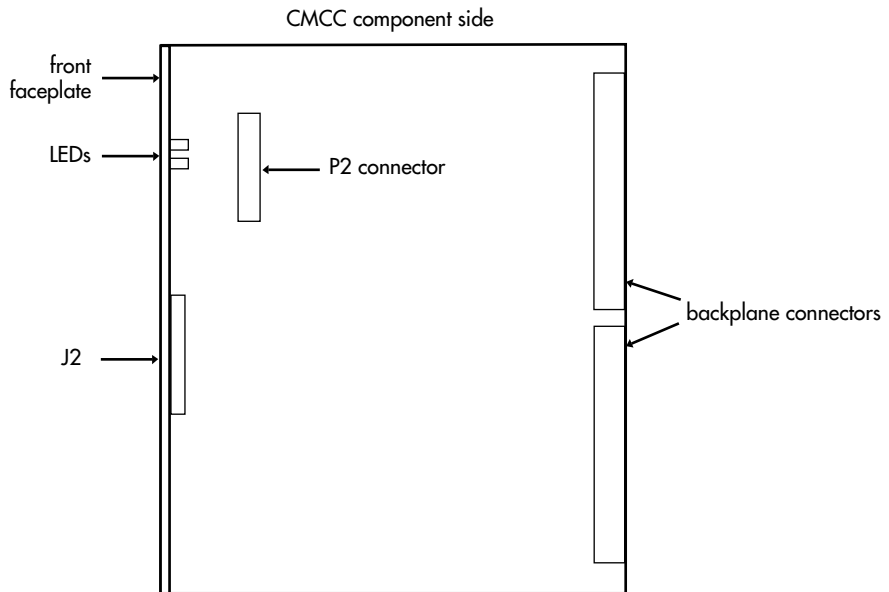


Figure 24 : Option 11 Meridian Companion card configuration—Expansion cabinet



## Installing the cards

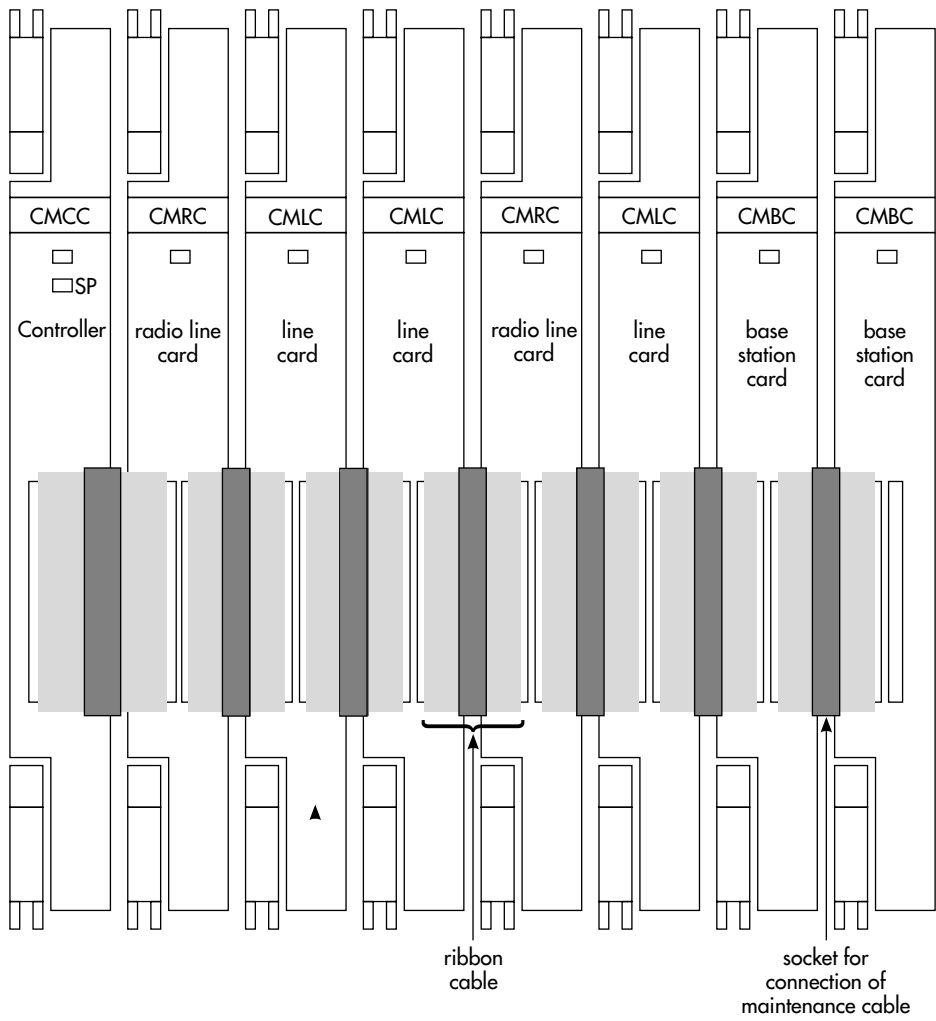
1. Install all expansion cards for your system first. If you are not using expansion cards, proceed to step 3. Verify appropriate card LED behavior, as described in “Normal LED behavior upon installation” on page 60.
2. Connect each card with the adjacent cards, moving from *right to left*, using the interboard faceplate cable harness and the bypass faceplate cable harness, for IPE shelves only. (Both are 60-wire faceplate cables. The bypass cable is an extra long cable used on Option 51 through Option 81 IPE shelves to connect cards across the NT8D01 Controller Card.) Do not leave empty slots between cards.
  - a. Make sure the red wire is at the bottom of the cable. (The cable is polarized to guard against incorrect insertion.)
  - b. Insert the J2 (right) cable plug into connector J1 (left) on the card on the far right.
  - c. Insert the J1 (left) cable plug into connector J2 (right) of the next card.
  - d. Insert the J2 plug of the next cable harness into connector J1 of the next card.
  - e. Use a blunt object to press the cable plug and then close the connector latches securely. Do not use the latches to press the cable plug.
  - f. Continue inserting cables from right to left, joining the J1 plug of one line card with the J2 connector of the next line card, until the daisychain reaches the CMCC on the left most card.
  - g. Leave the last faceplate cable hanging for CMCC installation.
3. Insert the two plastic ROM card standoffs into the CMCC holes that are aligned with the ROM card holes.
4. Slide the ROM card into the right-angled connector mate P2 on the CMCC.

**Figure 25 : P2 plug location**

5. Fasten the ROM card securely to the standoffs.
6. Install the CMCC on the IPE Module. The CMCC must be located to the left of any CMRC, CMLC or CMBC.
7. Connect the J1 plug of the last faceplate cable to the CMCC and verify appropriate card LED behavior, as described in “Normal LED behavior upon installation” on page 60.

Figure 26 illustrates how the system looks after you have installed cards and interboard faceplate cable harnesses.

Figure 26 : Example of cards



# System initialization

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Once the CMCC is installed and powered, the system begins initialization.

## Verifying initialization

### Are arrow indicators flashing?

If the indicators on the Administration Terminal do not flash, see “Troubleshooting the Administration Terminal” on page 168.

### Do you see **Select Country**?

When a system is initially installed or after a coldstart, the Administration Terminal displays **Select Country**. If it does not display **Select Country**, perform a Memory Reset (see page 71).

Invoking country selection enables you to choose **Custom** or **Canada**. Selecting **Custom** lets you program dual tone multifrequency (DTMF) timing, pulse code modulation (PCM) coding, and language defaults. If you select **Canada**, these items are programmed by default. You can change some other programmable parameters that are defined by default (such as Dial Delay, Gain values, and side tone) by entering a general programming session (**Feature**  **\*** **\***  **1**).

Once **Select Country** appears, to indicate initialization is complete, press  **↓** . The display shows the first country selection. Press  **←**  or  **→**  until the desired country is displayed. Press **OK**.

After a country has been selected and confirmed, the system resets.

## Did you install more Base Stations?

New installations may require a Base Station software update. The system will begin downloading the software to the Base Stations, if required.

**Note:** If you are upgrading an existing system or you have added Base Stations, you may see two Base Station software download messages on the Administration Terminal display.

The Administration Terminal display shows **BS-1 Dload Start**. Some Base Stations may not be powered up at the same time; this message will repeat at the beginning of each download.

The Administration Terminal shows **BS 1 Dload Done** when all the Base Station software is downloaded. Some Base Stations may not be powered up at the same time, so this message may repeat.

## Do you see Re-Eval required?

Proceed with “Programming the Meridian Companion system” on page 73.



## Does the display show this message?

If display shows	and the system	then
Config Ambiguous	contains CMBC	Ensure a Base Station is connected to the CMBC. See Table 41 on page 174.

## Memory Reset

Memory Reset reinitializes the system, erasing any existing system memory and resetting it to the factory default values.

### ATTENTION!

**Only the installer should perform Memory Reset.**

Memory Reset erases all system data and clears all active calls. The registration information is part of the system data. If this data is erased, your portables will not work properly.

You must enter the Memory Reset code no later than 15 minutes after the Meridian Companion system has been powered up. If you enter the Memory Reset code at any time after the 15-minute interval, you hear an error tone, and the display shows **Startup denied**. If 15 minutes have elapsed since you powered up the system, remove and reinsert the CMCC to prepare for Memory Reset.

### Performing Memory Reset

1. Press  , then    . The display shows **Password:** .
2. Enter the Installer password. The default password is     .  
If the password is correct, the display shows **Erase all data?** .

If the password is incorrect, the display shows **Password:** . Press **RETRY** and enter the password again.

### ATTENTION!

#### Memory Reset will erase your system data!

Pressing **Yes** returns all the data in your system to the factory defaults. To exit with no impact on your system data, press **Ris** .

3. Press **YES** to reset the memory. The display shows **Select Country**.
4. Press  . The display shows the first country selection.
5. Press  or  until the desired country is displayed.
6. Press **OK**. The display shows the country name. Press **OK** to reset the memory or **CANCEL** to select another country. If **OK** has been selected, the display shows **Defaults applied**, indicating system initialization has begun.
7. If you added a Base Station that requires a software update, the system will begin downloading the software to the Base Station.
  - a. The Administration Terminal displays **BS-1 Dload Start**. Some Base Stations may not be powered up at the same time, and this message will repeat at the beginning of each download. Press **CLEAR** to clear the message. The download may take between 5 to 12 minutes to complete.
  - b. The Administration Terminal shows **BS-1 Dload Done** when all the Base Station software is downloaded. Some Base Stations may not be powered up at the same time, and this message may repeat. Press **CLEAR** to clear the message.
8. Wait for the display to read Re-Eval required, then proceed with "Programming the Meridian Companion system" on page 73.

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# Programming the Meridian Companion system

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For the system to operate properly, you must

- verify the presence of cards and Base Stations
- verify and, if necessary, reprogram the telephony data parameters
- program mobility data
  - program the Base Station radios that have an external antenna
- set the time and date
- set passwords

For information about using Companion Manager to program a Meridian Companion system, refer to *Companion Manager Installation and Operations Guide*.

Before programming a Meridian Companion system, see “Verifying a Meridian Companion installation” on page 99 to verify the installation.

## The Meridian Companion Programming and Provisioning Record



Record all programming in *Meridian Companion Programming and Provisioning Record*. *Meridian Companion Programming and Provisioning Record* is divided into two groups of information: system-wide programming and user-specific programming.

## The Administration Terminal

The Meridian Companion system can be programmed by means of an Administration Terminal. The Administration Terminal has a two-line display and three types of buttons. You cannot make or receive calls on the Administration Terminal when connected to a Meridian Companion system. It is used only for system programming and maintenance.

## Buttons

Administration Terminal buttons enable you to program and maintain the Meridian Companion system:

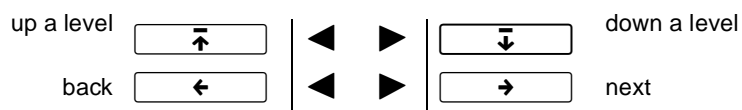
-  Use the Feature button to begin a programming session on the Administration Terminal.
-  Use the Release button to end a programming session on the Administration Terminal.

**Display buttons** The Administration Terminal has three display buttons directly below the display. During feature operation or programming, these display buttons provide options relating to the top line of text on the display. Available options appear on the bottom line directly above the corresponding display button.

The options above the display buttons are indicated in this guide in a special underlined typeface (for example, OK ). The other text in the display is shown in the special typeface but not underlined (for example, **Password:** ).

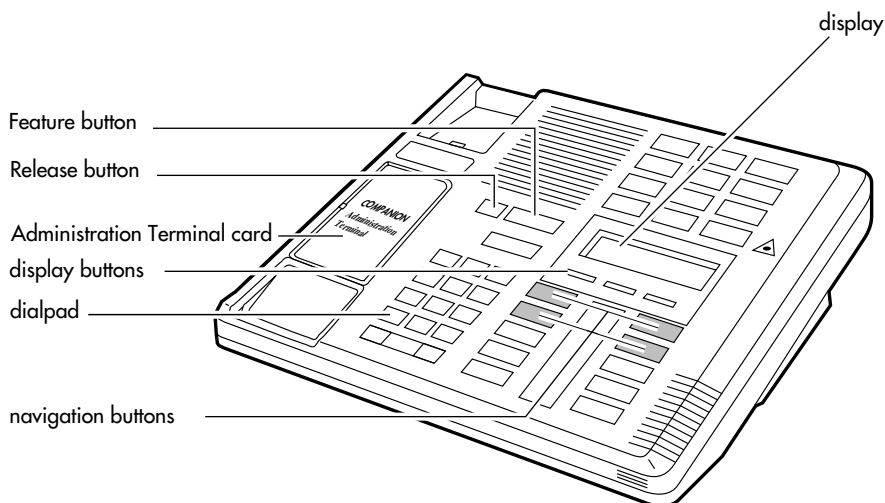
**Dialpad buttons** You use the Administration Terminal's dialpad buttons to enter feature codes and to select digits or letters when you need to enter a value on a display. You can enter letters as well as the digits represented on the dialpad buttons when programming some features (for example, System LID).

**Navigation buttons** The Administration Terminal has four navigation buttons directly below the display buttons. Use these buttons to search through programming options and settings. When a navigation button can be used, an arrow (◀ or ▶) appears in the window beside it. The navigation buttons are arranged as follows:



If the navigation buttons on your Administration Terminal do not correspond to the above arrangement, remove the button caps and place them on the correct buttons. The buttons below the navigation buttons are not used and have been disabled.

**Figure 27 : Administration Terminal**



# Operating the Administration Terminal

## Choosing Administration Terminal languages

### Standard Choices

During normal operation, you can select from among the two standard languages programmed into the Administration Terminal. Press

to select English,      for French. The default language is English.

### Customized Language Selection

On a system for which country selection was Custom, you can customize the languages available on the Administration Terminal using feature access codes.

During normal operation, you can select from among three languages programmed into the set. Press      to select the first language,      for the second language, or      for the third language. The default language is English.

1. Press     and enter the Installer password.
2. Press  then  until the display shows **3. Admin Set Data**.
3. Press  then  until the display shows **Set languages**.
4. Press . The display shows the first language prompt.
5. Press **CHANGE** to search through the list of available languages. The last value displayed is automatically set. (If this is the working language, the change takes place immediately.)
6. Press  to see the second language prompt.
7. Press **CHANGE** to search through the list of available languages. The last value displayed is automatically set. (If this is the working language, the change takes place immediately.)
8. Press  to see the third language prompt.

9. Press **CHANGE** to search through the list of available languages. The last value displayed is automatically set. (If this is the working language, the change takes place immediately.)
10. To exit, press **Rls** .

## Adjusting the contrast

If you find the Administration Terminal's display difficult to read, you can adjust the contrast.

**Note:** This feature will not work while you are in a Configuration, Maintenance, or Administration session.

1. Press **Feature** **\*** **7** . The display shows **Contrast level** followed by the current contrast level expressed as a digit.
2. Press a dialpad button between 1 and 9 to select a new contrast level, or press **DOWN** or **UP** .
3. Press **OK** or **Rls** to select the contrast level you prefer.

## Entering a Configuration programming session

1. Press **Feature** **\*** **\*** **0** .
2. Enter the Installer password. The default password is **0000** (see "Changing passwords" on page 92).

If the password is correct, the display shows **A. Configuration** .

If the password is incorrect, the display shows **Password:** . Press **RETRY** and enter the password again.

By using the arrow keys, you can select a programming category and find the appropriate submenus for items you want to program.

## Entering an Administration session

1. Press **Feature** **\*** **\*** **9** . The display shows **Password:** .

2. Enter the Administration password. The default password is  (see “Changing the Administration password” on page 93).

If the password is correct, the display shows **1.Registration** .

If the password is incorrect, the display shows **Password: .** Press **RETRY** and enter the password again.

**Note:** You can also enter an Administration session using the Configuration password. Once you complete steps 1 and 2 in “Entering a Configuration programming session” on page 77, press  then  . The display shows **1.Registration** .

## Ending a programming session

To end Configuration programming or an Administration session, press  . The display shows **End of session** .

## Recording and reporting alarm messages

Alarm messages appear on the display of the Administration Terminal when the Meridian Companion system generates an alarm. Your Meridian Companion supplier can interpret these messages to detect problems affecting system operation. The Administration Terminal must be connected to port 00 on the Controller to receive alarm messages.

This is an example of an alarm message:

Alarm:	51-3
TIME	CLEAR

See Table 41 on page 174 for other alarm messages.

### If an alarm message appears on the Administration Terminal's display

1. Record the alarm message in *Meridian Companion Programming and Provisioning Record*.
2. Press **TIME** and record the time and date displayed.



3. Press CLEAR to clear the alarm.
4. Call the system support representative to report the alarm message

## Verifying card status

Before performing any programming, it is important to verify that all cards are present on the system at the expected location. Use the following procedure to search through all card slot addresses pertinent to the Meridian Companion cards installed on the system.

1. Press     and enter the Installer password.
2. From **A.Configuration**, press  until the display shows **C.Maintenance**.
3. Press  then  until the display shows **2.Card Status**.
4. Press . The display shows **Show card**.
5. You can enter a number or press  to see the first card. The display shows **Cnn:** followed by the card type: **CMCC**, **CMRC**, **CMLC**, or **CMBC**.
6. Press STATE.
7. Press  to search through all slots, verifying that all cards are idle as described in “Card Status” on page 128.
8. Follow diagnostic procedures as necessary.

**Note:** The CMBC must have at least one powered Base Station connected for the system to recognize it.

## Verifying Base Station status

Before performing any programming, it is important to verify that all Base Stations are present on the system at the expected location.

You can verify Base Station status by checking that every Base Station is connected to a CMCC, CMRC, or CMBC.

**Note:** If a Base Station is not connected to a CMCC, CMRC, or CMBC, the MDF wiring is incorrect, the Base Station connections are incorrect, the powering is off (check the RPI), or the Base Station is defective. Correct and repeat the process before continuing with system programming.

### Verifying that a Base Station is associated with the specified TCM port

1. Press  \* \* 0 and enter the Installer password.
2. From **A. Configuration**, press  until the display shows **C. Maintenance**.
3. Press  then  until the display shows **4. TCM status**.
4. Press . The display shows **Show TCM:**.
5. You can enter a TCM device number or press  to see the first TCM device.

The display shows T followed by the five-digit device port number and the device type: **BS-1** (Base Station), **RAD**, or **7310** (M7310 Administration Terminal).

6. Press STATE. All BS-1s should be in the **Maint** state.
7. Search through TCM devices by pressing . The display should reflect the maintenance state. If it does not, refer to “Troubleshooting a Base Station” on page 169.

## Programming telephony data

Adjust telephony defaults only if instructed to do so via a product bulletin or other authority. The following telephony values can be changed:

- Dial delay
- B03 gain values
- Side tone
- CMCC slot
- WTN

### Dial delay

Dial delay is the time between the selection of an outgoing call line and transmission of the telephone number's first digit. The delay ensures that dial

tone is present before transmission. Delay ranges from 200 ms to 2,000 ms, in 200 ms increments, with a default of 1,000 ms.

### Changing the Dial delay setting

1. Press     and enter the Installer password.
2. From **A. Configuration**, press . The display shows **1. Telephony Data**.
3. Press . The display shows **Dial delay:** followed by the current delay value.
4. Press **CHANGE** until the desired delay value appears.
5. Record the programmed Dial delay in *Meridian Companion Programming and Provisioning Record*.
6. Press  to exit or press  to continue setting telephony data.

## B03 gain value modification

The Meridian Companion system contains digital interconnections that establish various digital signal paths within the system. There are currently five paths.

- PBX (Meridian 1) to CPP (Cordless Portable Part)
- CPP (Cordless Portable Part) to PBX (Meridian 1)
- PBX (Meridian 1) to RAD
- RAD to PBX (Meridian 1)
- TONE (DTMF signal generator) to PBX (Meridian 1)

**Note:** See “List of terms” on page 191 for further explanation of terms.

By default, the gain associated with the paths upon installation is 0. Product bulletins or other special circumstances may require the installer to adjust the gain values.

Values are stored in increments of 0.1 dB, although they appear on the display without decimals. For example, a value of 4.7 dB is stored as 47. A positive

value represents a gain; a negative value represents a loss. If a value outside the valid range is entered, the closest valid value is used.

### Adjusting gain values

1. Press  \* \* 0 and enter the Installer password.
2. From **A. Configuration**, press  . The display shows **1. Telephony Data** .
3. Press  , then  until the display shows **B03 Gain Values** .
4. Press  . The display shows **PBX – CPP:** followed by the current value.
5. Press **CHANGE** to enter a new value.
6. Press **+/-** to indicate a negative or positive value.
7. Enter the digits. Remember that digits appear without decimal points. Press **BACKSP** to make corrections. Press **OK** when you have entered the value.
8. Press  to search for the next signal path.
9. Press  to exit or press  to continue setting programming features.

### Portable telephone side tone

This option enables (you can hear your own voice when using the portable) or disables (you cannot hear your own voice when using the portable) the side tone. The default setting at installation is **On** (side tone enabled). This is the proper setting for most installations. If required, you can change the setting by following this procedure:

1. Press  \* \* 0 and enter the Installer password.
2. From **A. Configuration** , press  . The display shows **1. Telephony Data** .
3. Press  then  until the display shows **Side tone:** .
4. Press **CHANGE** to switch between **On** (side tone enabled) and **Off** (side tone disabled).

5. Press **RLS** to exit or press **→** to continue setting telephony data.

## CMCC slot

CMCC slot allows you to verify, and if necessary, adjust the card slot address reported by the Meridian Companion system. Certain system configurations may require you to adjust the address (value) by applying an offset value. Contact your distributor if you require additional information about the system configuration. The display shows the address as **CC XUU**, where **CC** is the card slot address, **X** indicates the type of adjustment (positive, negative, or unchanged), and **UU** is the offset value. If an adjustment is required, upon reset, the offset is applied to each card slot address as the cards come online.

### ATTENTION!

If the card slot address requires an adjustment and you do not make this adjustment, the WTN addresses will not be consistent with the M1 addresses.

## Changing the CMCC slot address

1. Press **Feature** **\*** **\*** **0** and enter the Installer password.
2. From **A. Configuration**, press **↓**. The display shows **1. Telephony Data**.
3. Press **↓**, then **→** until the display shows **CMCC slot:** followed by the slot address.
4. Press **→** to continue in telephony data if the card address is correct, or press **+** or **-** until the correct card slot address is displayed.
5. Press **APPLY** when the correct address is displayed. The display shows **Warm Reset?**.
6. Press **RESET** to save the new address and begin a warm reset.

**Note:** **CANCEL** does not save any of the changes and does not initiate a warm reset.

7. Repeat steps 1 to 4 (after the warm reset) to verify the correct address has been applied. The offset value will also be displayed. This value may be important for troubleshooting purposes.

## Dual tone multifrequency timing

DTMF timing, which can be changed only if the installer specified **Custom** during the country selection procedure, includes three elements: tone burst (duration of tone for each digit), interdigit time (time between sending tones for two digits), and pause time (time required to send a pause character). All three are set in milliseconds, and are set automatically during initialization. Follow this procedure to step through the list of precoded times.

1. Press     and enter the Installer password.
2. Press  . The display shows **1. Telephony Data** .
3. Press  , then  until the display shows **DTMF Timing**.
4. Press  . The display shows **Tone burst:** and the current setting.
5. Press **CHANGE** to search through the precoded times. The last value displayed is automatically selected.
6. Press  . The display shows **Interdigit:** and the current setting.
7. Press **CHANGE** to search through the precoded times. The last value displayed is automatically selected.
8. Press  . The display shows **Pause:** and the current setting.
9. Press **CHANGE** to search through the precoded times. The last value displayed is automatically selected.
10. Press  to return to the category menus or press  to continue in Configuration programming.

## Pulse code modulation mode

Pulse code modulation (PCM), which can be changed only if the installer selected **Custom** during the country selection procedure, defines how analog voice signals are encoded for transmission. The PCM mode is set automatically to  $\mu$ -law or A-law during initialization.

### Changing PCM modes

1. Press     and enter the Installer password.
2. Press  . The display shows **1. Telephony Data** .
3. Press  , then  until the display shows **PCM mode**
4. Press CHANGE to switch between **Mu Law** and **A Law**. The last value displayed is automatically set.
5. If the value hasn't changed, press  to continue Mobility data.  
If the value has changed, a warm reset is required. Press APPLY. The display shows **Warm Reset?**.
6. Press RESET to begin warm reset.

**Note:** CANCEL does not save the change and does not initiate a warm reset.

## WTN

With X11 release 24 and the MC32 feature (package 350), the number of wireless terminals per card can be changed from 16 to 32.

### Changing the number of wireless terminals per card

1. Press     and enter the Installer password.
2. From **A. Configuration** , press  . The display shows **1. Telephony Data** .
3. Press  , then  until the display shows **16 WTN** or **32 WTN**.
4. Press  to continue in telephony data if the number of wireless terminals per card is correct, or press CHANGE until the correct number of wireless terminals per card is displayed (either **16 WTN** or **32 WTN**).
5. Press APPLY when the correct number of wireless terminals per card is displayed. The display shows **Warm Reset?** .
6. Press RESET to save the change and begin a warm reset.

**Note:** CANCEL does not save any of the changes and does not initiate a warm reset.



## Programming mobility data

By default, the system has no radios assigned to any cells upon installation. Assignment occurs when the wireless system is activated. Up to eight radios can be assigned to a cell. A radio cannot be assigned to more than one cell, and reassigning a radio to a new cell automatically deletes the radio from its former cell.

Before activating the wireless system, you may have to program the antenna settings or the System Access Logical Identifier.

A five-digit number identifies each radio. The first four digits indicate the card and unit number (CCUU) associated with the Base Station. The last digit indicates the number of the radio on that Base Station, 1 or 2.

“Setting the antenna type for a radio” on page 87 applies to sites that are using one or more external antennas. The procedure described in “Setting the System Access Logical Identifier” on page 88 is optional and applies only to a small number of sites.

### Setting the antenna type for a radio

You must tell the system when an external antenna is installed or removed. The default at system startup is **internal**. Record the current setting in *Meridian Companion Programming and Provisioning Record*.

1. Press     and enter the Installer password.
2. From **A. Configuration**, press  . The display shows **1. Telephony data** .
3. Press  . The display shows **2. Mobility Data** .
4. Press  then  until the display shows **Radios**.
5. Press  . The display shows **Show radio:** .
6. Enter the five-digit number of the radio you wish to program. The display shows **Cell Assignment** .
7. Press  . The display shows **Antenna Type** .
8. Press  . The display shows the radio number (CCUU) followed by either **internal** or **external**, depending on the current setting.

9. Press **CHANGE** to change to the other antenna type.
10. Record the antenna type programmed for the radio in *Meridian Companion Programming and Provisioning Record*.
11. Press  to switch the setting of the next radio, or press  to exit.

**Note:** You must run System Reevaluation (see page 140) after changing antenna settings.

## Setting the System Access Logical Identifier

The four-digit Logical Identifier (LID) lets the Meridian Companion system identify itself to portable telephones, and the portables use it to request service from the system. The LID must be a hexadecimal number (four characters composed of a combination of the digits 0 to 9 and the letters A to F) between 0500 and FFEE. The default is randomly generated by the system at startup. The LID generally should not be modified.

There are only two reasons to modify the LID.

- The site has multiple Meridian Companion systems, and you want users to be able to move from system to system without changing slots on their portable telephones. All systems must be set to the same LID.
- Two systems that are located near each other were accidentally assigned the same LID; users of one system can access the other system. (This highly unlikely situation could occur, for example, in an office building occupied by multiple organizations.)

### **ATTENTION!**

#### **Changing the LID disables all portables.**

If you change the LID on an existing system that has registered portables, you will invalidate the registration of all the portables on the system. Portables must be reregistered before they can be used with the system, or the LID must be changed back to its previous value.

Only an installer should change the LID.

1. Press     and enter the Installer password.
2. From **A. Configuration**, press  . The display shows **1. Telephony Data** .
3. Press  . The display shows **2. Mobility Data** .
4. Press  then  until the display shows **System LID: xxxx** .
5. Press **CHANGE** to change the LID.
6. Enter the new system LID.

**Note:** To enter 1, 4, 5, 6, 7, 8, 9, or 0, press the corresponding dialpad button. To enter A, B, C, D, E, F, 2, or 3, press the dialpad button indicated in the following table until the desired character is displayed.

Character	Dialpad button	Press
A	<input type="text" value="2"/>	once
B	<input type="text" value="2"/>	twice
C	<input type="text" value="2"/>	three times
2	<input type="text" value="2"/>	four times
D	<input type="text" value="3"/>	once
E	<input type="text" value="3"/>	twice
F	<input type="text" value="3"/>	three times
3	<input type="text" value="3"/>	four times

7. When you have entered the desired character, press  to move the cursor to the next character position.
8. Repeat steps 6 and 7 until four characters have been entered.  
To correct a character, press  or  to move the cursor to the desired position, then repeat step 6.
9. Press **OK** . If the LID entered is valid, the display shows **LID changed** , then **System LID:** followed by the new System LID.

If the LID entered is not valid, the display shows **LID not changed** . Go back to step 5 and repeat the process.

10. Record the new LID in *Meridian Companion Programming and Provisioning Record*.
11. Press **[Rls]** to exit or press **[↩]** to continue in Configuration programming.

## Programming the system time and date

The Meridian Companion system maintains its own time and date rather than using the Meridian 1 time and date. It is important that the time and date be correct for event and alarm messages.

An idle Administration Terminal displays the current system time and date when it is functioning properly. Portable telephones do not display time and date.

Program the time and date as soon as the system is operating, and adjust the time and date whenever necessary. The time should be reset after the yearly switches to and from daylight savings time so that system messages have the correct time and date. It is also necessary to reprogram the time (and other settings) if the CMCC has been powered down for maintenance or for any other reason.

### Programming the system time

1. Press **[Feature]** **[\*]** **[\*]** **[9]** and enter the Administration password. The display shows **1. Registration** .
2. Press **[→]** until the display shows **3. Time and Date** .
3. Press **[↓]** . The display shows **Time** and the current setting.
4. Press **CHANGE** . The display shows **Hour:** . If you do not want to change the hour, go to step 7.
5. Press **CHANGE** . The display shows **Hour:** .
6. Enter the hour in 12- or 24-hour format, as one or two digits. (The Administration Terminal displays the time in 12-hour format.)

7. Press  . The display shows **Minutes:** . If you do not want to change the minutes, press  twice to continue in the Administration session. To exit, press  .
8. Press **CHANGE** . The display shows **Minutes:** .
9. Enter the minutes as one or two digits.
10. Press  . If the hour entered was less than or equal to 12, the display indicates **AM** or **PM** . Press **CHANGE** to select AM or PM.
11. Press  to exit or press  to continue in Administration programming.

## Programming the system date

1. Press     and enter the Administration password. The display shows **1.Registration** .
2. Press  until the display shows **3. Time and Date** .
3. Press  . The display shows **Time** and the current setting.
4. Press  . The display shows **Date** and the current setting.
5. Press **CHANGE** . The display shows **Year:** . If you do not want to change the year, go to step 8.
6. Press **CHANGE** . The display shows **Year:** .
7. Enter the last two digits of the year.
8. Press  . The display shows **Month:** . If you do not want to change the month, go to step 11.
9. Press **CHANGE** . The display shows **Month:** .
10. Enter the month as one or two digits.
11. Press  . The display shows **Day:** . If you do not want to change the day, go to step 14.
12. Press **CHANGE** . The display shows **Day:** .
13. Enter the day of the month as one or two digits.
14. Press  to exit or press  to continue in Administration programming.

## Changing passwords

### Changing the Installer password

To enter Configuration and Administration programming, Maintenance, and Memory Reset, you must use the Installer password. The default password is . The Installer password must have at least one digit and no more than six digits.

#### ATTENTION!

**You should change the Installer password after the system is installed to protect the integrity of the settings.**

To prevent unauthorized access, provide the Installer password only to selected personnel.

#### ATTENTION!

##### Record your password.

Record any password changes in *Meridian Companion Programming and Provisioning Record*. If you forget the Installer password, you will not be able to enter Programming, Maintenance, Memory Reset, or System Startup.

1. Press  to enter Configuration programming. The display shows **Password:**.
2. Enter the Installer password. The display shows **A. Configuration**.
3. Press  then  until the display shows **3. Admin. Set Data**.
4. Press . The display shows **Installer Pswd.**.
5. Press **CHANGE**. The display shows **New Pswd:**.
6. Enter a new one- to six-digit Installer password. Use **BKSP** to correct your entry if necessary.

7. Press **OK** . The display shows **Re-enter:** .  
If you do not enter any digits and press **OK** , the display shows **Pswd not changed** .
8. Reenter the digits and press **OK** . The display shows **Password changed** .  
If the display shows **Pswd not changed**, you did not enter the same password again. Go back to step 5.
9. Record the new Installer password in *Meridian Companion Programming and Provisioning Record* .
10. Press **RLS** to exit or press **→** to continue in Configuration programming.

## Changing the Administration password

The one- to six-digit Administration password gives a system administrator access to Administration programming. The default password is

**9 9 9 9** .

### ATTENTION!

**You should change the Administration password after the system is installed to protect the integrity of the settings.**

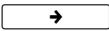
To prevent unauthorized access, provide the Administration password only to selected personnel.

1. Press **Feature** **\*** **\*** **9** . The display shows **Password:** .
2. Enter the Administration password. The display shows **1. Registration** .
3. Press **→** until the display shows **4. Passwords** .
4. Press **↓** . The display shows **Admin. Password** .
5. Press **CHANGE** . The display shows **New Pswd:** .

6. Enter up to six digits for the new password. Use **BACKSP** for corrections.

### ATTENTION!

If you leave the Administration password blank (by entering no digits in step 6), the password will be erased. If you erase the password, anyone can enter Administration programming without restriction. (The display shows **Password erased.**)

7. Press **OK** to confirm the new password. The display shows **Re-enter:**.
8. Reenter the new password and press **OK**. The display shows **Password changed**.  
  
If the display shows **Pswd not changed**, you did not enter the same password again. Go back to step 5.
9. Record the new password in *Meridian Companion Programming and Provisioning Record*.
10. Press **RLS** to exit or press  to continue in Administration programming.

## Changing the Registration password

You must enter the Registration password on each portable to successfully register it with the Companion system. The default password is **7 2 3 4 6** (or **R A D I O**), but you should set your own password. You can choose any combination of one to six digits. You will find it easier to remember the password if the numbers correspond to a word.

### ATTENTION!

**You should change the Registration password after the system is installed to protect the integrity of the settings and to avoid adjacent systems from having the same password.**

To prevent unauthorized access, provide the Registration password only to selected personnel.



1. Press     . The display shows **Password:** .
2. Enter the Administration password. The display shows **1. Registration** .
3. Press  until the display shows **4. Passwords** .
4. Press  . The display shows **Admin. Password** .
5. Press  . The display shows **Reg. Password** .
6. Press **CHANGE** . The display shows **New Pswd:** .
7. Enter a new one- to six-digit Registration password. Use **BKSP** for corrections.
8. Press **OK** . The display shows **Re-enter:** .

**Note:** If you do not enter any digits and press **OK** , the display shows **Pswd not changed** .

9. Reenter the digits and press **OK** . The display shows **Password changed** .

If the display shows **Pswd not changed** , you did not enter the same password again. Go back to step 6.

10. Record the new Registration password in *Meridian Companion Programming and Provisioning Record*.
11. Press  to exit or press  to continue in Administration programming.



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# Activating wireless communication

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## Activating a new system

You must run System Reevaluation to activate the system.

1. Enter Configuration programming.
2. Press  . The display shows **1. Telephony Data** .
3. Press  until the display shows **2. Mobility Data**.
4. Press  . The display shows **Re-Evaluation** .
5. Press  . The display shows **Re-Eval status**.
6. Press  . The display shows **Re-Eval required**.
7. Press CONTINUE. The display shows **Re-Evaluate now?**.
8. Press YES. The display shows **Calls will drop**.
9. Press EXECUTE. The display shows **Re-Eval pending**.
10. Press  to exit. The display shows **Re-Eval in prog.**

The display shows **Radios left:nnn**, where nnn represents the number of radios to be activated.

11. Wait until the display shows **Re-Eval complete** before proceeding to the next section. Press CLEAR to clear the message.



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## Verifying a Meridian Companion installation

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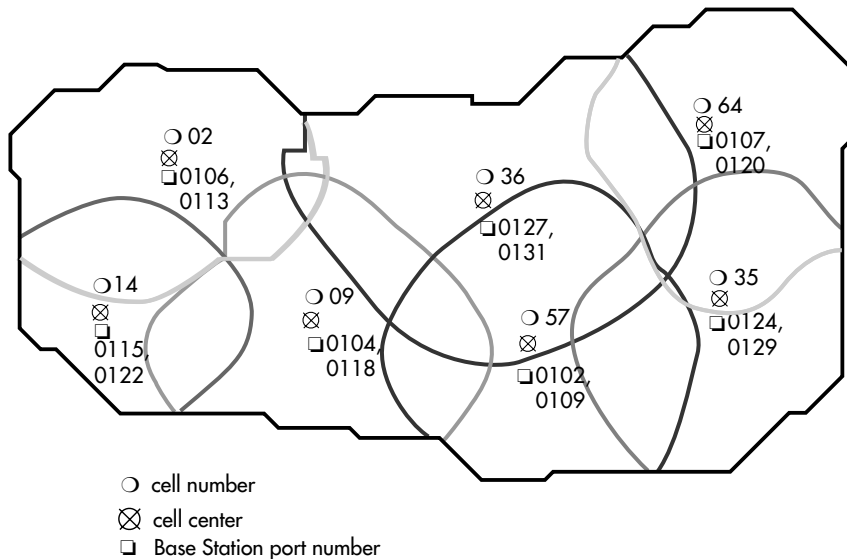
After the system has been activated, verify that it is operating as intended. Use the following list as a guide:

- Verify there are no unusual error log messages. If you see anything other than the normal event messages, refer to Table 43: Event messages in the Administration log, on page 181.
- Verify that all the Base Stations radios are acting properly. They should now be in **IDLE** or **CSC Radio** state, if not, see “Troubleshooting a Base Station” on page 169. (See “Verifying Base Station status” on page 80.)
- Determine cell assignments and transcribe these onto the floor plan (see Figure 31 on page 100). See the procedure on page 100.
- Register a test portable, see “Registering and verifying portable telephones” on page 119.
- Enable the RSSI measurement feature. Refer to *Meridian Companion Portable Telephone Registration Instructions* for additional information.

**Note:** If you cannot establish a connection with a given radio, see “Troubleshooting a Base Station” on page 169.

- Using the floor plan as a guide, walk around the site, trying to pass through each cell while on a call to ensure that hand-off is occurring. Observe the RSSI on the portable display (see your *Meridian Companion Portable Telephone Registration Instructions*). The RSSI value should remain at or above the cell boundary value defined in the *Meridian Companion Site Planning Reference Manual*.

**Figure 31: Floor plan with transcribed information**



**Note 1:** The cell boundary value should be a high-power measurement. An **H** on the portable's display indicates the portable is transmitting in high-power mode (an **L** indicates low-power mode).

**Note 2:** RSSI measurements are displayed as negative values. The smaller the negative value the stronger the signal strength. For example, a signal strength of **-60** dBm is stronger than one of **-73** dBm.

If a significant area within the coverage area has an RSSI signal strength less than the cell boundary value, refer to *Meridian Companion Site Planning Reference Manual* to redeploy cell centers in the impacted area to fill the gap, or add an additional cell center if necessary.

## Viewing radio and cell assignments

This procedure checks the integrity of the programming and should occur immediately after reevaluation.

All radios present on the system should now be assigned to a cell. If any radios are not assigned to a cell, check the Event/Alarm log to see if any Base Stations appear defective. Replace if necessary and repeat the reevaluation.

Check to make sure that Base Stations have been clustered into cells as indicated in the site plan. Add cell numbers and Base Station TCM addresses to the site plan. If there are inconsistencies, check the wiring to make sure that Base Stations are wired to the correct port, that the installation matches the deployment plan, and the site has not changed since the site deployment.

1. Enter Configuration programming.
2. Press  . The display shows **1. Telephony Data** .
3. Press  . The display shows **2. Mobility Data** .
4. Press  , then  until the display shows **Cells** .
5. Press  , then  until the display shows **Show cell:** .
6. Enter the three-digit number of the first cell to be verified. (You can use **BKSP** to correct typing mistakes.)  
The display shows **Cxxx radios** .
7. Press  . The display shows either **No radio** or **ccoun assignd** .
8. Press  to see the next radio. Continue pressing the arrow to search through the radios.
9. Press  to exit or  to continue.

## Identifying a radio's cell assignment

To identify a radio's cell assignment:

1. Enter Configuration programming.
2. Press  then  until the display shows **2. Mobility Data** .
3. Press  . The display shows **Re-Evaluation** .
4. Press  . The display shows **Radios** .
5. Press  . The display shows **Show radio:** .

6. Enter the five-digit number of the radio you want to examine. The display shows **Cell Assignment** .
7. Press  . The display shows the cell to which this radio is assigned. The display will either show the radio number **in cell nn** or **ccuu not assigned** .
8. Press  or  to search through the cell assignments of other radios.
9. Press  four times to return to **2. Mobility Data** .



## Configuring the Meridian 1 for the Meridian Companion system

Configuring portable telephones on a Meridian 1 system is similar to setting up 2500 telephones. You need to be familiar with the 2500 set configuration before you configure the Meridian 1 for the Meridian Companion system. If you have never configured 2500 sets on a Meridian 1 system, review the installation procedures in *Meridian 1 System Installation Procedures* before working with Meridian Companion portable telephones.

1. Verify the card status of the Meridian 1 system.
2. Change the ringer default using Table 14.

The ringer default determines the maximum number of telephones that can be in the ringing state at the same time. For analog phones, change the ringer default from 8 to 16 to ensure that portable telephones ring when receiving incoming calls.

**Table 14 : LD 97—Changing the ringer default parameters**

Prompt	Response	Meaning
REQ	CHG	change or print peripheral equipment parameters
TYPE	XPE	shelf controller and super loop configuration
XPEC	0, 1-95, xx	assigns shelf controller number
LOC	xxxxxx	location code for shelf controller
MED	<cr>	connection media
RGTP	(8), 16	16 set to concurrent ringers

3. Enable class of service in LD 15.
4. Refer to X11 documentation to determine what release you have.

**Note:** For access to Meridian Companion privacy and extended features, you must have X11 release 20B with package 240 installed and enabled.

If you have X11 release 15 or greater without package 240, follow the instructions on page 104.

If you have release 20B or greater with package 240, follow the instructions on page 105.

5. Refer to “Programming options” on page 107 for information on the optional programming for different releases. If the customer chooses, the terminal number block (TNB) data can be printed using LD20. LD 81 (for systems running X11 release 20B software) can be used to print a listing of Meridian Companion wireless terminal numbers (WTNs), and LD 95 can be used to change, create, or remove the Call Party Name Display (CPND) name.

Each portable telephone can have its own business features and class of service. All portable telephones have access to 2500 set features available to wired users. For information on implementing features, refer to *X11 Features and Services*. Refer to *X11 Input/Output Guide* for a complete listing of all prompts associated with each LD.

## **X11 release 15 or greater without package 240**

With X11 releases 15 through 21 without package 240 installed, configure the portable telephone as a 2500 set with Class of Service (CLS) set to DTN as shown in Table 15.

Use LD 20 to print the Terminal Number (TN) to verify that the configuration is correct. The portable telephone cannot receive CLID or CPND information. By specifying CLS = MWA, LPA activates the Message Waiting icon for a portable telephone.

**Table 15 : LD 10—X11 release 15 or greater without package 240: Configuring a TN for a portable**

Prompt	Response	Meaning
REQ	NEW	new telephone
TYPE	500	telephone type
TN	I s c u (Opt. 21-81) I u (Opt. 11)	terminal number
CDEN	4D	quadruple density
DES	x...x	ODAS telephone designator. Enter one- to six-character alphanumeric ODAS designator.
CUST	0–99	customer number
DIG	<cr>	
DN	xxx...x	directory number
MARP	YES/(NO)	use TN as the MADN redirection prime
CPND		
CLS	DTN	
CLS	XFA THFA	enabling transfer for the Transfer Radio Loss function

## X11 release 20B or greater with package 240

Before programming, refer to the list of users in the *Meridian Companion Programming and Provisioning Record* for information needed to set the Multiple Call Arrangement Allowed/Multiple Call Arrangement Denied (MCRA/MCRD) Wireless Privacy feature.

To access Meridian Companion features such as CPND/CLID display and wireless privacy on the Meridian 1 system, package 240 must be installed and enabled, and WRLS set to YES.

If package 240 is not enabled, the WRLS prompt does not appear. CNDA/CNDD and MCRA/MCRD cannot be accepted as values for CLS, and an error message appears. (LD 83, available with X11 release 20B, prints a list of wireless sets.)

There is one exception to the package 240 requirement: if package 131 is on, MCRA/MCRD is an acceptable CLS value. If the package is not on, use the steps described in “X11 release 15 or greater without package 240” on page 104 to program the Meridian Companion portable telephones.

See Table 15 for the prompts and responses in LD 10 that apply to Meridian Companion. The defaults appear in parentheses and new prompts are bolded in Table 16.

**Table 16 : LD 10—X11 release 20B or greater with package 240: Configuring a WTN for a portable**

Prompt	Response	Meaning
REQ	NEW	new telephone
TYPE	500	telephone type
TN	I s c u (Opt. 21-81) I u (Opt. 11)	terminal number
CDEN	4D	quadruple density
DES	CT2+	ODAS telephone number
CUST	0–99	customer number
<b>WRLS</b>	<b>YES/(NO)</b>	indicates that the TN corresponds to a portable telephone; CLID is enabled as a default
DN	xxx...x	directory number assigned to the portable
CLS	<b>CNDA/(CNDD)</b>	user can see the name associated with the number dialed if CPND is set up for the customer
CLS	<b>MCRA/(MCRD)</b>	Multiple Call Arrangement Allowed (privacy)/Multiple Call Arrangement Denied (no privacy)
CLS	(DTN)	digital signaling used by portable telephone (this is the default only if WRLS = YES)

**Table 16 : LD 10—X11 release 20B or greater with package 240: Configuring a WTN for a portable (continued)**

Prompt	Response	Meaning
CLS	XFA/(XFD)	enabling transfer for the Transfer Radio Loss function

## Wireless telephone privacy

To implement Wireless Privacy for Meridian Companion:

1. Using LD 11, set KEY 0 to NUL (wired line set).
2. Using LD 10, set CLS to MCRA (wireless portable).
3. Using LD 11, set KEY 0 to MCR XXXX (wired line set).

## Programming options

Use LD 20 to print Terminal Number Block data as shown in Table 17 and Table 18.

**Table 17 : LD 20—X11 releases 15 or greater without package 240: Printing values**

Prompt	Response	Meaning
REQ	PRT	to print information
TYPE	500	telephone type
TN	I s c u	terminal number

**Table 18 : LD 20—X11 release 20B with package 240: Printing new values**

Prompt	Response	Meaning
REQ	PRT	to print information
TYPE	500	telephone type
TN	I s c u	terminal number
WRLS	YES/(NO)	indicates that the TN corresponds to a portable telephone

**Table 18 : LD 20—X11 release 20B with package 240: Printing new values (continued)**

Prompt	Response	Meaning
CLS	<b>CNDA/(CNDD)</b>	user can see the name associated with the number dialed if CPND is set up for the customer
CLS	<b>MCRA/(MCRD)</b>	Multiple Call Arrangement Allowed (privacy)/Multiple Call Arrangement Denied (no privacy)
CLS	(DTN)	default digital signaling used by portable telephone

Use LD 81 to print a list of or count the wireless portable telephones with selected features, that are used on the Meridian Companion system (available only with X11 release 20B or greater). Prompts for LD 81 appear in Table 19.

**Table 19 : LD 81—X11 release 20B with package 240: Printing features and station**

Prompt	Response	Meaning
REQ	LST, CNT	list or count
CUST	0–99 0–99	one customer or range of customers
DES	ABC	
FEAT	<b>CNDA/ CNDD/ MRCA/ MCRD/ WRLS</b>	sets with the selected features will be printed or counted

Use LD 81 to print a list of Terminal Numbers or Terminal Number Blocks.

**Table 20 : LD 83—X11 release 20B with package 240: Printing TN and TNB**

Prompt	Response	Meaning
REQ	LST, TNB	prints list of Terminal Numbers or Terminal Number Blocks in designated order
CUST	x, x–y, <cr>	one customer (x), range of customer numbers (x–y), all customers (<cr>)

Assign names to portables in the CPND data block in LD 95.

**Table 21 : LD 95—X11 releases 15–18: Adding, changing, or deleting a CPND name**

Prompt	Response	Meaning
REQ	NEW/CHG/OUT	add, change, or delete a name
TYPE	NAME	CPND name
CUST	0–99	customer number
<b>DIG</b>	<b>0–2045 0–99</b>	existing Dial Intercom Group and member number
DN	xxxx	existing DN of eligible type
DCNO	0–254	IDC conversation table number

**Table 22 : LD 95—X11 release 19 or later: Adding, changing, or deleting a CPND**

Prompt	Response	Meaning
REQ	NEW/CHG/OUT	add, change, or delete a name
TYPE	NAME	CPND name
CUST	0–99	customer number
<b>DIG</b>	<b>0–2045 0–99</b>	existing Dial Intercom Group and member number
DN	xxxx	existing DN of eligible type
_Name	xxxxxxx	name
_XPLN	(16)– 24	expected name length range (between 16 and 24)
_DISPLAY-FMT	<b>(LAST), FIRS</b>	<b>display format for CPND names</b>

Use LD 73 to define a new data block.

**Table 23 : LD 73—X11 release 20B: Defining, changing, or printing a data block**

Prompt	Response	Meaning
REQ	NEW/CHG/PRT	New, change, or print
TYPE	PRI2/PRI	PRI data block
FEAT	PAD	Pad category
PDCA	1–16	Pad category table
...	...	
BRIT	Rx Tx	BRI trunk
<b>WRLS</b>	<b>Rx Tx</b>	<b>Meridian Companion</b> <b>R = Receive</b> <b>T = Transmit</b> <b>x = pad value (0–26)</b>

## X11 release 24 with package 350, feature MC32

X11 release 24 with package 350 requires package 240. For information on package 240, see “X11 release 20B or greater with package 240” on page 105.

Feature MC32 enables octal density on Meridian Companion cards.

**Table 24 : Card Capacity**

Cards	With MC32	Prior to MC32
CMCC	32 Users, 16 Base Stations	16 Users, 16 Base Stations
CMLC	32 Users, 0 Base Stations	16 Users, 0 Base Stations
CMRC	32 Users, 16 Base Stations	16 Users, 16 Base Stations
CMBC	0 Users, 16 Base Stations	not available



**Table 25 : LD 10—X11 release 24 with package 350: Configuring a WTN for a portable**

Prompt	Response	Meaning
REQ	NEW	new telephone
TYPE	500	telephone type
TN	l s c u (Opt. 21-81) l u (Opt. 11)	terminal number
CDEN	4D	quadruple density
DES	ABC	
CUST	0–99	customer number
WRLS	YES/(NO)	indicates that the TN corresponds to a portable telephone; CLID is enabled as a default
<b>MWUN</b>	<b>(16)/32</b>	changes card density for portable telephones
DN	x...x	directory number assigned to the portable
CLS	CNDA/(CNDD)	user can see the name associated with the number dialed if CPND is set up for the customer
CLS	MCRA/(MCRD)	Multiple Call Arrangement Allowed (privacy)/Multiple Call Arrangement Denied (no privacy)
CLS	(DTN)	digital signaling used by portable telephone (this is the default only if WRLS = YES)
CLS	XFA/(XFD)	enabling transfer for the Transfer Radio Loss function
CLS	THFA/(THFD)	enabling transfer across analog trunks

**Note:** For system upgrades

If any TN on a Companion card is datafilled with the WRLS prompt set to “no”, you will need to remove “out” all the TNs on the card and redatafill them with the WRLS prompt set to “yes”. If the WRLS prompt for all the TNs on a card are set to “yes”, change the MWUN prompt from “16” to “32” and datafill TNs 16 to 31.

**Table 26 : LD 20—X11 release 24 with package 350: Printing values**

Prompt	Response	Meaning
REQ	PRT	to print information
TYPE	500	telephone type
TN	l s c u	terminal number

Use LD 81 to print a list of the wireless portable telephones used on the Meridian Companion system (available only with X11 release 20B or greater). Prompts for LD 81 appear in Table 19.

Use LD 81 to print a list of Terminal Numbers or Terminal Number Blocks in designation (DES) order.

**Table 27 : LD 81—X11 release 24 with package 350: Printing TN and TNB**

Prompt	Response	Meaning
REQ	LST, TNB	prints list of Terminal Numbers or Terminal Number Blocks in designated order
CUST	x, x-y, <cr>	one customer (x), range of customer numbers (x-y), all customers (<cr>)
DES	d...d	FCC telephone designator
New information to be printed:		
WRLS	YES/(NO)	indicates that this TN corresponds to a portable personal telephone
MWUN	(16)/32	changes card density for portable telephones
CLS	CNDA/(CNDD)	prints new CLS for WRLS
	MCRA/(MCRD)	Multiple Call Arrangement Allowed (privacy)/ Multiple Call Arrangement Denied (no privacy)
	DTN	default digit signaling used by portable personal telephone

Assign names to portables in the CPND data block in LD 95.

**Table 28 : LD 95—X11 releases 15–18: Adding, changing, or deleting a CPND name**

Prompt	Response	Meaning
REQ	NEW/CHG/OUT	add, change, or delete a name
TYPE	NAME	CPND name
CUST	0–99	customer number
DIG	0–2045 0–99	existing Dial Intercom Group and member number
DN	xxxx	existing DN of eligible type
DCNO	0–254	IDC conversation table number

**Table 29 : LD 95—X11 release 19 or later: Adding, changing, or deleting a CPND**

Prompt	Response	Meaning
REQ	NEW/CHG/OUT	add, change, or delete a name
TYPE	NAME	CPND name
CUST	0–99	customer number
DIG	0–2045 0–99	existing Dial Intercom Group and member number
_DISPLAY-FMT	(LAST), FIRS	display format for CPND names
DN	xxxx	existing DN of eligible type
_DISPLAY-FMT	(LAST), FIRS	display format for CPND names
DCNO	0–254	IDC conversation table number
_DISPLAY-FMT	(LAST), FIRS	display format for CPND names

Use LD 73 to define a new data block.

**Table 30 : LD 73—X11 release 20B: Defining, changing, or printing a data block**

Prompt	Response	Meaning
REQ	NEW/CHG/PRT	New, change, or print
TYPE	PRI2/PRI	PRI data block
FEAT	PAD	Pad category
PDCA	1–16	Pad category table
...	...	
BRIT	Rx Tx	BRI trunk
WRLS	Rx Tx	Meridian Companion R = Receive T = Transmit x = pad value (0–26)
MWUN	(16)/32	changes card density for portable telephones

**Table 31 : LD73 Overlay 10 Error Messages**

Prompt	Meaning
SCH0334	wireless and wireline sets have been provisioned on the same line card
SCH0810	incompatible wireless card density

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## Programming user options

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You can program the feature that controls call transfer on radio loss through the Administration Terminal or through Companion Manager. This section explains how to program the feature through the Administration Terminal. For information about programming this feature through Companion Manager, refer to *Companion Manager Installation and Operations Guide*.

### Programming Call Transfer on Radio Loss

If a portable telephone user moves beyond radio range or if the battery in the portable telephone becomes weak, the call may be dropped. To keep calls from terminating abruptly, program the system so that it transfers dropped calls to another number.

There are three values for Transfer on Radio Loss:

- **None** (the default): Calls are not transferred.
- **Dflt**: Calls are transferred to the default for the system, for example, a receptionist.
- A specific number: Calls are transferred to the specified number, for example, an answering machine.

**Note:** There can be a delay of about 10 seconds between the time that the link is lost and the time that the call is transferred.

## Programming a system default for radio loss handling

To program a system default telephone number for transferring a call on radio loss, enter an Administration programming session and do the following:

1. Press     and enter the Administration password.  
The display shows **1.Registration** .
2. Press  . The display shows **2.User Options** .
3. Press  . The display shows **Radio loss hdlng** .
4. Press  to specify a default telephone number. The display shows **Change Default** .
5. Press  . The display shows the default number or **None** .
6. Press **CHANGE** .
7. Enter up to 16 digits for the default phone number using 0 to 9 and \*.  
The \* will add a two second pause. Use **BACKSP** for corrections
8. Press **OK** to confirm the telephone number. The display shows **Change Default** .
9. Press  to exit.

## Programming individual Transfer on Radio Loss

To program an individual telephone number for transferring a call on radio loss, enter an Administration programming session and do the following:

1. Press     and enter the Administration password.  
The display shows **1.Registration** .
2. Press  . The display shows **2.User Options** .
3. Press  . The display shows **Radio loss hdlng** .
4. Press  to specify a default telephone number. The display shows **Change Default** .
5. Press  . The display shows **Change WTN:** .
6. Enter the WTN. The display shows **Wccuu:** .

7. Press CHANGE to specify a new telephone number or press DFLT to specify the default telephone number. Enter up to 16 digits for the default phone number using 0 to 9 and \*. The \* will add a two second pause. The DFLT key label appears only if a default telephone number has previously been specified. Use BKSP for corrections.
8. Press OK to confirm the telephone number. The display shows WCCUU followed by the number.
9. Press  to go to the next WTN.

**Note:** If OK is pressed and no digits have been entered, the telephone number is deleted and WCCUU: None appears in the display. Go back to step 5.





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# Registering and verifying portable telephones

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To register portable telephones to a system, you use the Administration Terminal or Companion Manager together with the portable.

This section describes registration and verification using the Administration Terminal. For information about how to register portables using Companion Manager, see the *Companion Manager Installation and Operations Guide*. For more information about the Administration Terminal, refer to the *Meridian Companion Administration Terminal Operations Guide*.

You can use the Administration Terminal to perform the following functions:

- enable registration (no portable telephones can be registered unless the system registration is enabled)
- check the status of each WTN
- deregister a WTN due to portable telephone loss or breakage
- check to make sure that sufficient credits are available

Before a portable will operate, it must be registered with the system. Ensure that you are within range of a functioning Base Station when you register the portables.

When you distribute the portables, inform the users that the portables are registered and give them the corresponding registration slot numbers or system name. Portables can be registered to a maximum of nine different Companion systems.

To register the portables you perform the following:

- Enable registration for the Meridian Companion system and ensure there are sufficient credits.
- Register the portables.
- Verify the operation of each portable.
- Disable registration for the Meridian Companion system.

## Enabling and disabling registration

You must enable registration for the entire Meridian Companion system to allow individual portables to register. The options are Yes (Y) and No (N). Yes indicates that Master Registration is enabled. No is the default and indicates that Master Registration is not enabled.

**Note:** To prevent interference problems with neighboring systems, set the Master Registration to N when the portables are no longer being registered.

1. Press  \* \* 9 and enter the Administration password. The display shows **1. Registration**.
2. Press . The display shows **Mstr Reg Enbl:** followed by the currently set Master Registration setting, Y or N.
3. To change to the other setting, press **CHANGE**.
4. To continue in Administration programming, press , or to exit, press  to exit.

## Locking Registration on (optional)

**Mstr Reg Enbl:** automatically returns to N 30 minutes after the last registration. It is recommended that you allow Registration to time out in most circumstances. Leaving Registration enabled can interfere with registration in neighboring systems. However, if you are registering a large number of portables and do not want registration to time out, you can lock it on.

1. On the Administration Terminal, press  \* \* 9. The display shows **Password:**.

2. Enter the Administration password (default password is **9 9 9 9** ). The display shows **1.Registration** .
3. Press **↓** until the display shows **Mstr Reg Enbl: .**
4. If required, press **CHANGE** until the display shows **Mstr Reg Enbl: Y .**
5. Press **→** until the display shows **Reg Locked: N, Y**
6. Press **CHANGE** until the display shows **Reg Locked: Y.**

## Registering portable telephones

Refer to *Meridian Companion Portable Telephone Registration Instructions* for additional information.

## Verifying a portable telephone's operation

After you register a portable you should

- verify the WTN
- verify the portable can make or receive calls
- conduct a signal strength test
- verify any optional features

### Verifying the WTN

1. Open the portable flap.
2. Press **Feature** . The display shows **FEATURE LIST** .
3. Press **▽** or **△** until the display shows **Feature request** .
4. Press **SELECT** . The display shows **A-** .
5. Press **\* 0** . The display shows the WTN for three seconds.

### Verifying the portable can make or receive calls

1. Verify that the portable telephone has a dial tone. (Ensure that the portable telephone's twinned desk telephone, if any, is idle.)

2. From another telephone, dial the directory number that maps to the registered WTN.

If the portable telephone rings, it is functioning properly.

If the portable telephone does not ring, check the Meridian 1 programming to ensure that the WTN has the proper directory number assignment.

To conduct a signal strength test establish a connection with a radio, first ensure that you get a connection with the same radio. To do so, use Directed RSSI and measure the Receive Signal Strength Indicator (RSSI) level (see the user guide for the portable telephone for instructions on connecting to the radio). Replace any portable telephone whose reading is significantly different from the others.

**Note:** An RSSI value of -35 dBm is the strongest (best) possible signal strength. As the signal fades, the absolute value of the RSSI number increases. The link drops as the value approaches -100 dBm.

## Optional checks

If Transfer on Radio Loss has been programmed, verify that it is operating properly:

1. From another telephone, make a call to the portable telephone.
2. Remove the batteries and wait 10 seconds for the link to drop.

After the 10 seconds of silence, the calling telephone should hear ringback and the destination phone should ring, indicating the call has been transferred.

If the portable telephone does not appear to be operating correctly, see Table 40: Troubleshooting portable telephones, on page 172.

## Deregistering the WTN

Refer to *Meridian Companion Administration Terminal Operations Guide*.

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# Maintenance

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This section includes information on the following:

- maintenance commands associated with the Meridian 1 system
- maintenance commands associated with the Meridian Companion Administration Terminal
- system failures (exceptions)
- alarm and event descriptions and actions
- hardware maintenance actions

## Using maintenance commands

A number of commands in LD 32 can be used to examine Meridian Companion from the perspective of the Meridian 1 system. The Meridian Companion Administration Terminal can be used to examine the Meridian Companion system components to determine that they function properly.

## Meridian 1 card maintenance

Table 32 shows commands available in LD 32 for the CMCC, CMRC, CMLC, and CMBC. For additional information on these commands, refer to *X11 Input/Output Guide*. Some of the commands vary slightly for Option 11 systems (refer to Option 11 documentation).

**Table 32 : Maintenance and diagnostic commands in LD 32**

Commands	System responses	Description
STAT I s	shows status	indicates whether unit is idle, busy, or disabled
STAT (loop)	shows status	indicates status of loop
STAT I s c	shows status	indicates status of specified card
STAT I s c u	shows status	indicates status of specified unit
ENLC I s c	enables card	enables the specified card
ENLL loop	enables loop	enables network loop
ENLN loop	enables card	enables network card with specified loop
ENLS I s	enables shelf	enables specified shelf
ENLU I s c u	enables unit	specified unit enabled
DISC I s c	disables card	removes specified card and associated TNs from operation
DISI I s c	disables card	disables specified card when it becomes idle
DISL loop	disables loop	disables network loop
DISN loop	disables network card	disables network card containing specified loop
DISS I s	disables shelf	disables all cards on specified shelf
DISU I s c u	disables unit	disables specified unit

## Administration Terminal maintenance commands

Maintenance programming enables you to monitor and control Meridian Companion operation at a hardware component level: system, card, WTN TCM device.

All maintenance functions described in this section start at the Maintenance menu. To access the Maintenance menu through the Administration Terminal

1. Press     . The display shows **Password:** .
2. Enter the Installer password. The display shows **A. Configuration** .
3. Press  until the display shows **C. Maintenance** .

Six features can be accessed at this point. See the following section for a description of each.

4. To end a session, press  .

To access maintenance functions through Companion Manager, refer to *Companion Manager Installation and Operations Guide*.

## Maintenance features

There are six features in the maintenance menu.

- system status
- card status
- WTN status
- TCM status
- Event/Alarm log
- Administration log

The first four features are typically used when a problem or a system change occurs. The two log features should be used to verify, record, and clear the corresponding logs periodically.

The softkeys common to many of these tasks are labeled ENBL (enable) and DSBL (disable). The confirming messages associated with the DSBL key are

**Disable at once?** and **Disable at idle?** . The softkey appears only when the state is **Busy** or **Wait Idle** .

The following maintenance tasks can be performed using the Administration Terminal, as shown, or Companion Manager. For Companion Manager instructions, refer to *Companion Manager Installation and Operations Guide*.

## System Status

The System Status feature enables you to check the system type and state and perform system level maintenance actions.







1. Press     and enter the Installer password.
2. From **A. Configuration** , press  until the display shows **C. Maintenance** .
3. Press  . The display shows **1. System Status** .
4. Press  . The display shows the product name ( **MC** ) and protocol ( **PCI** ).
5. Press **STATE** to see the operational state of the system, described in Table 33.
6. Press **TYPE** at any point to reset the display to show the product name and protocol, as indicated in step 4.
7. Press  to see the software version and release number.
8. Press  to exit, or  to continue in Maintenance programming.

**Note:** The system can be disabled if the state is **Busy** , **Failed** , **Idle** , or **Wait Idle** . Pressing **DSBL** shows **Disable at once?** on the display. You can select either **YES** (the system enters the **Disabling** state), or **CHANGE** (you are asked whether to disable



upon idle; a YES response places the system in the Wait Idle state).

**Table 33 : System states and actions**

State	Meaning	Possible action
Idle	system is enabled but not in use (no active calls or links)	<u>D<del>S</del>BL</u> or <u>T<del>Y</del>PE</u>
Disabling	Meridian Companion system is being disabled due to system or user action	<u>T<del>Y</del>PE</u>
Enabling	system is being enabled following installation or a reset	<u>T<del>Y</del>PE</u>
Busy	system is in use	<input type="text"/>  to see the number of busy WTNs, <input type="text"/>  then <input type="text"/>  to see the number of TCM devices, <u>D<del>S</del>BL</u> , or <u>T<del>Y</del>PE</u>
Wait Idle	All idle WTNs and TCM devices have been disabled; active WTNs and TCM devices will be disabled as soon as calls terminate.	<u>D<del>S</del>BL</u> to disable immediately; <input type="text"/>  to see the number of busy WTNs, <input type="text"/>  then <input type="text"/>  to see the number of TCM devices; otherwise, <u>T<del>Y</del>PE</u>
Dsbl Sys	All system WTNs and TCM devices have been disabled due to a system detected exception.	treat exception that caused system to become disabled
Dsbl User	All system WTNs have been disabled by the user.	<u>ENBL</u> to reenable, or <u>T<del>Y</del>PE</u>

# Card Status

The Card Status feature enables you to check the card type and state and perform card level maintenance actions.

1. Press     and enter the Installer password.
2. From **A. Configuration**, press  until the display shows **C. Maintenance**.
3. Press  , then press  until the display shows **2. Card Status**.
4. Press  . The display shows **Show card**.
5. You can enter a number or press  to see the first card. The display shows **Cnn:** followed by the card type: **CMCC**, **CMRC**, **CMLC**, or **CMBC**.
6. Press  to see the firmware version of the current card.
7. Press **STATE** to see the card state described in Table 34.

**Note:** Pressing **TYPE** at any point resets the display to show the card number and type, as indicated in step 5.







8. Press  and  to view other cards.
9. Press  to exit, or  to continue in Maintenance programming.

**Note:** The card can be disabled if the state is **Busy**, **Failed**, **Idle**, or **Wait Idle**. Pressing **DSBL** shows the question **Disable at once?** on the display. You can select either **YES** (the card enters the **Disabling** state), or **CHANGE** (you are asked whether to disable upon idle; a **YES** response places the card in the **Wait Idle** state).

**Table 34 : Card states and actions**

State	Meaning	Possible action
Idle	card is enabled but not in use	<u>TYPE</u>
Enabling	card is being enabled	<u>TYPE</u>

Table 34 : Card states and actions (continued)

State	Meaning	Possible action
Disabling	card is being disabled	<u>TYPE</u>
Failed	TCM device has failed	<u>D5BL</u> takes failed TCM device offline and sets the state to <u>D5b1 User</u> ; verify power and wiring
Unequipped	No operational card is in this slot; normally this appears only if the slot is empty during a disable/enable process.	<u>D5BL</u>
Busy	card is in use	<input type="text"/>  to see the number of busy WTNs, <input type="text"/>  then <input type="text"/>  to see the number of TCM devices, <u>D5BL</u> , or <u>TYPE</u>
Wait Idle	All idle WTNs and TCM devices are immediately disabled; remaining WTNs and TCM devices will be disabled as soon as calls terminate.	<u>D5BL</u> to disable immediately; <input type="text"/>  to see the number of busy WTNs, <input type="text"/>  then <input type="text"/>  to see the number of TCM devices; otherwise, <u>TYPE</u>
D5b1 Sys	All card WTNs and TCM devices have been disabled due to a system detected exception.	treat exception that caused system to become disabled
D5b1 User	All card WTNs have been disabled by the user.	<u>ENBL</u> to reenable, or <u>TYPE</u>

## Wireless Terminal Number (WTN) Status

The WTN Status feature enables you to check the WTN type and status. There are no maintenance actions available because they can be performed from the Meridian 1 side.

1. Press  \* \* 0 and enter the Installer password.
2. From **A. Configuration**, press  until the display shows **C. Maintenance**.
3. Press , then press  until the display shows **3. WTN Status**.
4. Press . Enter the WTN.
5. You can enter a number or press  to see the first WTN. The display shows **W** followed by the four-digit WTN and the WTN type.
6. Press **STATE** to see the WTN state as shown in Table 35.

**Note:** Pressing **TYPE** at any point resets the display so it shows the card number and type as indicated in step 3.

7. Use  and  to view other WTNs.
8. Press **Rls** to exit or  to continue in Maintenance programming.

**Table 35 : WTN states and actions**

State	Meaning	Possible action
Idle	The WTN is enabled but not in use.	<b>TYPE</b>
Disabling	The card is in the process of being disabled.	<b>TYPE</b>
Failed	The WTN module has failed.	handle at card level
Busy	The WTN is in use.	<b>TYPE</b>
Wait Idle	The card has been disabled when idle. This WTN still has an active call. It will be disabled as soon as the call terminates.	handle at card level

**Table 35 : WTN states and actions (continued)**

<b>State</b>	<b>Meaning</b>	<b>Possible action</b>
Maint.	The WTN has been disabled from the Meridian 1 side.	After the Meridian 1 system enables the WTN, the state becomes Idle or Busy.
Dsbl User	All WTNs have been disabled by user.	handle at card level
Dsbl Sys	All WTNs have been disabled by system.	treat exception that caused WTN to become disabled

## TCM Status

The TCM Status feature enables you to check the TCM device type and status and perform TCM level maintenance actions.

1. Press     and enter the Installer password.
2. From **A. Configuration**, press  until the display shows **C. Maintenance**.
3. Press  , then press  until the display shows **4. TCM Status** .
4. Press  . The display shows **Show TCM:** .
5. You can enter a TCM device number or press  to see the first TCM device.

The display shows **T** followed by the five-digit TCM device port number and the TCM device type: **B5-1** (Base Station), **RAD** , or **7310** (M7310 Administration Terminal).

6. If the TCM device has associated software or firmware, you can press  to see the version of the software/firmware. (If there is no software/firmware, the  button does not appear.)
7. Press **STATE** to see the TCM device state as shown in Table 36.

The TCM device can be disabled if the state is **Idle** , **Busy** , **Failed** , **Maint** , **CSC Radio** , **Equipped** , or **Wait Idle** . Pressing **DSBL** shows **Disable at once?** on the display. You can select **YES** (the TCM device enters the **Disabling** state), **CHANGE** (you are asked whether to disable upon idle; a **YES** response places the TCM device in the **Wait Idle** state), or **TYPE** .

**Note:** Pressing **TYPE** at any point resets the display so it shows the TCM device number and type as indicated in step 5.

8. Press  or  to view other TCM devices.
9. Press  to exit or  to continue in Maintenance programming.

**Note:** The Administration Terminal cannot be disabled.

**Table 36 : TCM device states and actions**

State	Meaning	Possible action
Idle	TCM device is enabled but not in use	<u>TYPE</u>
Disabling	TCM device is being disabled	<u>TYPE</u>
Enabling	TCM device is being enabled following installation or a reset	<u>TYPE</u>
Failed	TCM device has failed	<u>Dsbl</u> takes the failed device offline and sets the state to <u>Dsbl User</u> .
Equipped	will display for RAD or 7310 TCM	<u>Dsbl</u>
Unequipped	No TCM device has ever been associated with the port number (type = NONE).	The state becomes <u>Idle</u> or <u>Busy</u> when a TCM device becomes associated with the port number.
Busy	TCM device is in use	<u>Dsbl</u> or <u>TYPE</u>
Wait Idle	TCM device will be disabled as soon as current traffic terminates	<u>Dsbl</u> to disable immediately; <u>TYPE</u>
Maint.	TCM device is not in normal operating mode (the Base Stations are not configured into cells, or they are downloading new software, or CDS is running)	configure using the Mobility Data programming features
CSC Radio	A radio is in use as a common signalling channel. There is one radio per cell designated as a CSC radio.	<u>Dsbl</u> or <u>TYPE</u>
Dsbl User	user has disabled TCM device	<u>ENBL</u> or <u>TYPE</u>
Dsbl Sys	system has disabled TCM device	treat exception that caused TCM device to become disabled

## Event/Alarm log

Status (alarm and event) messages appear on the display and are stored in the Event/Alarm log.

Alarms indicate important and sometimes abnormal system conditions. The details of every alarm, including date and time, should be noted as soon as possible, and the alarm cleared. Alarms may require some action to clear.

With the Event/Alarm log, you can

- check alarms and events that have occurred
- check when alarms and events occurred
- check a current alarm
- check the number of consecutive occurrences of an event or an alarm
- erase the log

### ATTENTION!

**Because the Event/Alarm log holds a maximum of 50 events, you should check and record these alarms and events periodically. Erase the log after dealing with the alarms and events. If your system is also equipped with Companion Manager, these logs can be printed as a report.**

When the log is full, alarms are replaced with new alarms of higher priority.

Each event is assigned a severity number. An **S** preceding this number (for example, **S4**) may appear in the event message. **S1** has the lowest priority. If the log is full, new event messages with a higher severity number replace existing event messages of a lower severity. For this reason, check event messages at regular intervals and deal with all messages.

If an event or alarm occurs while you are using the Administration Terminal for programming, your session will not be disrupted. Instead, the alarm message and beep will occur after the programming session ends.



The Event/Alarm log indicates what alarms and events occurred, when they occurred, and how many times they occurred.

## Entering the Event/Alarm log

1. Press     and enter the Installer password.
2. From **A. Configuration**, press  until the display shows **C. Maintenance**.
3. Press , then press  until the display shows **5. Event/Alarm Log**.
4. Press . The display shows **Start of new log** or **Start of log**.
5. Press  or  to search through alarms and events in the log.
6. Press  twice to continue in Maintenance programming.

## Checking the most recent alarm

1. Enter the Event/Alarm log.
2. Press **ALARM**. The display shows an alarm code if there is an uncleared alarm, or **No current alarm**.
3. Press **EXIT** to return to the Event/Alarm log, or press **OK** if an alarm message was displayed.

## Checking when an alarm or event occurred

1. Enter the Event/Alarm log.
2. Press  or  to search through the alarms and events in the log.
3. Press **TIME**. The display shows the date and time that the alarm or event last occurred, then returns to the alarm.

## Checking consecutive repetitions of an alarm or event

1. Enter the Event/Alarm log.
2. Press  or  to search through the alarms and events in the log.
3. Press REPEAT . The display shows the number of consecutive times that the alarm or event occurred, then returns to the previous display.

## Erasing the log

1. Enter the Event/Alarm log.
2. Press ERASE . The display shows **Erase log?**.
3. Press YES . If no new alarms or events have been added since the list was entered, the log is erased and the display shows **Log is empty** , then **5.Event/Alarm Log** . If new alarms or events have been added since the list was entered, the display shows **Log has changed** .

## Administration log

The Administration log lists event messages for administrative events such as system initialization, Configuration sessions in which a change was made, invalid password attempts, and password changes. By using this feature you can

- check what events occurred
- check when the events occurred
- check the number of consecutive occurrences of an event
- erase the log

### ATTENTION!

Because the Administration log holds a maximum of 10 events, you should verify and record these events periodically. Erase the log after dealing with the events. If your system is also equipped with Companion Manager, these logs can be printed as a report.

Each event is assigned a severity number. An **S** preceding this number (for example, **S4**) may appear in the event message. **S1** has the lowest priority. If the log is full, new event messages with a higher severity number replace existing event messages of a lower severity. For this reason, check event messages at regular intervals and deal with all messages.

## Entering the Administration log

1. Press     and enter the Installer password.
2. From **A. Configuration**, press  until the display shows **C. Maintenance**.
3. Press  , then press  until the display shows **6. Admin Log**.
4. Press  . The display shows **Start of new log** or **Start of log**.

5. Press ALARM . The display shows an alarm code if there is a current alarm.
6. Press  or  to search through events in the log.
7. Press TIME to see the date and time of an alarm's most recent occurrence.
8. Press REPEAT to see how many times the alarm has occurred.
9. To erase the log, press ERASE .

**Note:** If new alarms have occurred since the log was accessed, the display shows **Log has changed** . Otherwise, the display shows **Log is empty** .

10. Press  to continue in Maintenance programming.

## Checking when an event occurred

1. Enter the Administration log.
2. Press  or  to search through the events in the log.
3. Press TIME . The display shows the date and time that the event last occurred, then returns to the previous display.

## Checking the most recent alarm

1. Enter the Administration log.
2. Press ALARM . The display shows an alarm code if there is an uncleared alarm, or **No current alarm** (see Table 41 on page 174).

## Checking consecutive repetitions of an event or alarm

1. Enter the Administration log.
2. Press  or  to search through the events in the log.
3. Press REPEAT . The display shows the number of consecutive times that the event or alarm occurred, then returns to its previous display.

## Erasing the Administration log

1. Enter the Administration log.
2. Press ERASE . The display shows **Erase log?** .
3. Press YES . If no new events have been added since the list was entered, the log is erased and the display shows **Log is empty** , then **6.Admin Log** . If new events have been added since the list was entered, the display shows **Log has changed** .

## Responding to event and alarm messages

The alarm messages are displayed on the Administration Terminal. This is an example of an alarm message:

**Alarm: 51-04**  
**TIME CLEAR**

Report the alarm and the time it occurred to your installer or distributor.

## Responding to an alarm code

Alarm codes can take up to two minutes to be displayed on the Administration Terminal. If the system was turned off when the failure occurred, the alarm code appears two minutes after the system is turned on.

When you see an alarm code, follow these steps:

1. Record the alarm code.
2. To see when the alarm occurred, press TIME .
3. To clear the alarm, press CLEAR .
4. Determine the cause of the alarm using Table 41 on page 174.

## System Reevaluation

### ATTENTION!

**Unless this is a new installation, System Reevaluation disables the Meridian Companion system and should be performed after hours.**

All active calls will be dropped when System Reevaluation begins.

When the physical system configuration has changed significantly, such as a Base Station layout, you must run System Reevaluation so that the Meridian Companion system can adapt to the changes and provide optimum performance.

You will usually be notified when System Reevaluation is required (see explanation below).

You should run System Reevaluation when

- new Base Stations have been added
- the system has been relocated
- antenna settings have been changed

Keep these points in mind:

- If the system detects the need for System Reevaluation, you will see **Re Eval required** or **Re-Eval recommended** on the Administration Terminal. If reevaluation is recommended (and not required), you can clear the message if the system is unchanged, for example, if a faulty Base Station has been replaced.
- If **Re-Eval recommended** is displayed, it could be for the following two reasons:
  - a Base Station had lost power, or the TCM port had been disconnected and is now back in service
  - a Base Station has been replaced by another Base Station but the port has not changed

- If the antenna setting for a radio changes, System Reevaluation will be required.
- If a Base Station is removed or added while System Reevaluation is running, the reevaluation procedure will take twice as long to complete.

## ATTENTION!

**System Reevaluation must be performed for the new configuration to take effect.**

To run System Reevaluation, follow these steps:

1. Press  \* \* 0 and enter the Installer password. The display shows **A. Configuration**.
2. Press  . The display shows **1. Telephony Data** .
3. Press  .. The display shows **2. Mobility Data** .
4. Press  . The display shows **Re-Evaluation** .
5. Press  . The display shows **Re-Eval status** .
6. Press  . The display shows one of the following:

Message	Meaning	Action
Re-Eval required	The Meridian Companion system has detected a need for System Reevaluation.	Continue with step 7.
Re-Eval not req.	The Meridian Companion system did not detect the need for System Reevaluation.	Continue with step 7 if desired.

Message	Meaning	Action
Re-Eval recommended	The Meridian Companion system has detected a possible need for System Re-evaluation.	at the installer's discretion: <ul style="list-style-type: none"> <li>• continue with step 7</li> <li>• schedule a re-evaluation</li> <li>• <u>CLEAR</u> to continue without running System Reevaluation</li> </ul>
Re-Eval in prog.	The Meridian Companion system is currently running System Reevaluation.	Press <u>Rls</u> to exit and wait for display to show Re-Eval complete.
Re-Eval pending	System Reevaluation was requested but has not yet started.	Press <u>Rls</u> to exit and wait for display to show Re-Eval in prog., Re-Eval complete.

- Press CONTINUE. The display shows Re-Evaluate now?.
- If you want to run System Reevaluation later, press NO and see “Setting a scheduled time or date” on page 144.

If you want to run System Reevaluation now, press YES. The display shows Calls will drop.

To exit with no impact, press Rls or CANCEL.

### ATTENTION!

**System Reevaluation cannot be canceled once initiated.**

- Press EXECUTE. The display shows Re-Eval pending.
- Press Rls to exit. Re Eval in prog. is displayed.



11. The display shows **Re Eval complete** when the reevaluation procedure is completed. Press **CLEAR** to clear the message.

**Note 1:** You may receive alarm messages during this process, see “Responding to an alarm code” on page 139 for more information.

**Note 2:** Base Station download will increase the time by approximately 10 minutes.

Approximate run times for System Reevaluation are shown in the following table:

# Base Stations	Reevaluation run time (minutes)
20	6
40	14
60	19
80	23
100	28
120	32
>120	>34

## Scheduling System Reevaluation

You can view the scheduled time for System Reevaluation or schedule a time to run System Reevaluation.

### Verifying the scheduled time

- Press     and enter the Installer password. The display shows **A. Configuration**.
- Press  . The display shows **1. Telephony Data** .
- Press  . The display shows **2. Mobility Data** .
- Press  . The display shows **Re-Evaluation** .
- Press  . The display shows **Re-Eval status** .

6. Press  . The display shows **Re-Eval schedule** .
7. Press  . The display shows the time and date when System Reevaluation has been scheduled, or the display shows **Not scheduled** .
  - If the time and date displayed are correct, press  three times to continue in Configuration programming.
  - To schedule System Reevaluation or change the scheduled time, go to step 2 of “Setting a scheduled time or date”.
  - To cancel a scheduled System Reevaluation, press **CANCEL** .

### Setting a scheduled time or date

**Note:** The system accepts only a date and time set later than the current date and time.

1. Complete steps 1 to 7 of “Verifying the scheduled time”.
2. Press **CHANGE** . The display shows **Calls will drop at set time** followed by the current scheduled hour, or **0:01** if a time has not been scheduled.

If you do not want to change the scheduled time, go to step 4.

3. To schedule the time, press **CHANGE** . The display shows **Hour:** followed by the current scheduled hour (**00** if none scheduled).
  - a. Press **CHANGE** . The display shows **Hour:** . If you do not want to change the hour, go to step 3c.
  - b. Enter the hour in 12-hour or 24-hour format, as one or two digits.
  - c. Press  . The display shows **Minutes:** followed by the current scheduled minutes (**01** if none scheduled). If you do not want to change the minutes, go to step 3f.
  - d. Press **CHANGE** . The display shows **Minutes:** .
  - e. Enter the minutes as one or two digits.
  - f. Press  . If you entered an hour less than or equal to 12, the display prompts you with **AM** or **PM** . If you entered an hour greater than 12, go to step 4a to set the date or go to step 5 to continue in Configuration programming.

- g. Press **CHANGE** to select AM or PM.
4. To schedule the date, press  . The display shows **Date** followed by the current scheduled date (today's date if none scheduled).
- If you do not want to change the scheduled date, press  four times to continue in Configuration programming. (You may hear a beep after the first  .)
- To continue scheduling the date
- Press **CHANGE** . The display shows **Year:** followed by the currently scheduled year. If you do not want to change the year, go to step 4d.
  - Press **CHANGE** . The display shows **Year:** .
  - Enter the last two digits of the year.
  - Press  . The display shows **Month:** followed by the current scheduled month. If you do not want to change the month, go to step 4g.
  - Press **CHANGE** . The display shows **Month:** .
  - Enter the month as one or two digits between 1 and 12.
  - Press  . The display shows **Day:** followed by the current scheduled day. If you do not want to change the day, go to step 5.
  - Press **CHANGE** . The display shows **Day:** .
  - Enter the day of the month as one or two digits between 1 and 31.
5. Press  three times to continue in Configuration programming. (You may hear a beep after the second  .)

## Replacing equipment

### Adding or moving Base Stations

There are two reasons to add or move a Base Station.

- to correct deployment problems such as holes in a coverage area or not enough Base Stations to handle traffic in a given cell
- to facilitate system growth which will mean an increase in the coverage area or traffic

Considerations involved include

- making sure that there are no more than four Base Stations per cell
- verifying that there are enough spare TCM units on existing cards; otherwise, new CMRC or CMBC cards must be installed
- if necessary, relocating the system card set to a new shelf to accommodate new cards (see “Relocating the system” on page 151)
- installing or upgrading RPIs if no spare power ports are available on existing RPIs

To replace a Base Station, you do not have to power down the system. When you replace a Base Station, no portable registration information is lost. After a short initialization sequence, the Base Station will be disabled and System Reevaluation will be required to make the Base Station operational and include it into the configuration.

### **ATTENTION!**

**Taking a Base Station out of service causes radio coverage to degrade.**

The following instructions describe how to add or move a Base Station. The first eight steps apply only to moving a Base Station. If a Base Station is being added, begin with step 9.

1. Disable the associated TCM devices using the Administration Terminal or Companion Manager software (see “TCM Status” on page 132).
2. If the Base Station is powered locally, unplug the power supply from the AC outlet.
3. If an external antenna is installed, unplug its coaxial cable from the Base Station.
4. Remove the Base Station cover.
5. Unplug the TELADAPT cable from the Base Station.
6. Hold the Base Station (to prevent it from falling) while applying upward pressure to it.

7. Lift the Base Station away from the bracket. Remove TCM and power wires from the mounting bracket.
8. Remove the mounting base.
9. Mount and connect the Base Station (see “Installing Base Stations” on page 12).
10. Install and connect an additional RPI if required (see “Installing remote power interconnect units” on page 16).
11. Install an additional CMRC or CMBC card if required (see “Installing Meridian Companion cards” on page 59).
12. Make wiring changes as necessary (see “Wiring the Time Compression Multiplexing lines” on page 51). Make sure that any exposed wiring has secondary protectors installed.
13. If a Base Station is being moved, reenable previously disabled TCM devices as discussed in “TCM Status” on page 132.
14. If you have moved a Base Station, perform System Reevaluation. If you have added a Base Station to an existing cell, perform a manual re-evaluation.
15. Note configuration changes in *Meridian Companion Programming and Provisioning Record*.

## Replacing a defective Base Station

To replace a Base Station, you do not have to power down the system. When you replace a Base Station, no portable registration information is lost.

A **Re-eval recommended** message will be displayed. Your choices are to perform System Reevaluation, schedule it for off-hours, or **CLEAR** to disregard the message. You need to perform System Reevaluation only if the Base Station location changed in addition to replacing the defective Base Station.

If troubleshooting procedures (see “Troubleshooting a Base Station” on page 169) indicate that one or both Base Station radios are defective, the Base Station must be replaced as follows:

1. Disable the associated TCM devices using the Administration Terminal software (see “TCM Status” on page 132).

2. If the Base Station is powered locally, unplug the power supply from the AC outlet.
3. If an external antenna is installed, unplug its coaxial cable from the Base Station.
4. Remove the Base Station cover.
5. Unplug the TELADAPT cable from the Base Station.
6. Hold the Base Station (to prevent it from falling) while applying upward pressure to it.
7. Lift the Base Station away from the bracket.
8. Mount and connect the replacement Base Station (see “Installing Base Stations” on page 12).
9. Reenable previously disabled TCM devices as discussed in “TCM Status” on page 132.
10. A **Re-Eval recommended** message will be displayed.

## **Adding expansion cards**

Add CMRCs, CMLCs, or CMBCs to the system if existing cards cannot accommodate additional Base Stations or portable telephones. Expansion cards can be added to a live system as long as existing cards and faceplate cables are undisturbed. Alternatively, the entire system can be disabled during installation.

New cards must be added to the right of an existing system. If there is no space for additional cards to the right of the current system, try to move other Meridian 1 cards to create sufficient space (after disabling the cards using the Meridian 1 Administration Terminal). If it is impossible to create enough space by moving cards, relocate the Meridian Companion cards as described in “Relocating the system” on page 151.

Feature MC32 with Package 350 on an Option 11, Release 24 system effectively doubles the WTN or portable capacity of the cards. If you want to add more portable telephones, you can register an additional 16 on the existing CMCC, CMLC and CMRC cards.

If the number of portable telephones will stay the same and the area of coverage will increase, it may be necessary to deregister some portables from

a CMLC, reregister them to another expanded card and replace the CMLC with a CMBC.

If you are installing a new CMRC or CMBC, make sure enough power ports are available on existing RPIs to accommodate new Base Stations. If there are an insufficient number, RPIs must be added or upgraded as described in “Installing remote power interconnect units” on page 16.



## **STATIC!**

**Wear a grounding strap.**

Do not touch the printed circuit board or the connector. The printed circuit board is a static-sensitive device.

To install the new cards

1. Ensure the card slots are disabled on the Meridian 1 side. Refer to “Using maintenance commands” on page 123.
2. Insert the card or cards from right to left as described in “Installing Meridian Companion cards” on page 59.

The LEDs on the cards should come on immediately, flash three times, then remain on.

3. Faceplate cabling should be installed from right to left, with the last cable connecting the new card set to the live system. The SP LED on the CMCC card will begin flashing.

The card LEDs should go out about 20 seconds apart.

4. If a card LED remains on, refer to the troubleshooting guidelines described in “Troubleshooting a remote power interconnect unit” on page 170.
5. Approximately 30 seconds after the last card LED goes out, the SP LED stops flashing. Use the Administration Terminal to confirm the status as described in “Card Status” on page 128.
6. Enable the new cards from the Meridian 1 system, as described in “Card Status” on page 128.

7. Program the cards as described in “Configuring the Meridian 1 for the Meridian Companion system” on page 103.

## Optimizing Card Slot Usage

You can optimize the card configuration by enabling the double density feature (32 WTN) and replacing CMRC or CMLC cards with CMBC cards.

Users registered on the CMRC/CMLC cards being removed must be MANUALLY reregistered onto new WTN positions created on each of the remaining CMCC/CMRC cards. Automatic relocation of registration data is NOT provided. These relocated users must also be moved to the corresponding TN positions on the Meridian 1.

If a CMBC card is to be added to the card configuration, additional radio credits may be required.

Replace CMRCs or CMLCs at the right hand end of the system with CMBC cards to expand a system. Whereas normally this type of card configuration change would cause an exception condition (see “Config failure: Nonrecoverable inconsistency” on page 161), the change can be accomplished using the following procedure.

The following procedure outlines the process for replacing CMRC or CMLC cards with CMBC cards

1. Perform the system upgrade from DRx to DR4, but DO NOT EXECUTE RE-EVAL.
2. Clear all programmed portable data from the CMRC/CMLC cards to be removed.
  - a. De-register portables from the WTNs.
  - b. Remove any radio loss handling data for these WTNs (see “Programming Call Transfer on Radio Loss” on page 115).
  - c. Retain wireless TN datafill until step 8.
3. Disconnect the appropriate faceplate cables and remove the CMRC/CMLC cards to be replaced.
4. After the "Failed" alarms appear for the disconnected cards (i.e. Alarms 51/52 as appropriate), DISABLE then RE-ENABLE each of the



"Failed" cards (see "Card Status" on page 128). Once re-enabled, card status will change to "Removing".

5. Wait 5 minutes until the card(s) disappear from the configuration, then install the new CMBC cards and reconnect the faceplate cables.
6. Connect ALL additional base stations to ports on the CMBC cards, confirm they appear in "Maint" state on the appropriate ports, and then perform Re-Evaluation.
7. Enable the expansion to double user capacity on the existing cards (see "X11 release 24 with package 350, feature MC32" on page 110; see "WTN" on page 86). A warm reset will follow this programming.
8. Once the system has come on-line, perform the corresponding program data relocation on the Meridian 1 and reregister de-registered portables to the 16-31 WTN range on the expanded cards.

## Relocating the system

When new cards are added, it may be necessary to relocate the existing system within the same IPE Module (that is, shifting the cards to the left to accommodate new cards) or to another module. The following procedure applies to either case.



### **STATIC!**

**Wear a grounding strap.**

Do not touch the printed circuit board or the connector. The printed circuit board is a static-sensitive device.

**Note:** It is suggested that you perform a System Reevaluation and backup just before relocating the system.

1. If using a new IPE or CE/PE Module, complete installation and preparation of that shelf.
2. Disable the Meridian Companion system.
3. Disable the corresponding IPE card slots from the Meridian 1 side, as described in "Meridian 1 card maintenance" on page 124.

4. If other module cards are involved in the relocation, disable them as described in “Meridian 1 card maintenance” on page 124.
5. Remove faceplate cables from the Meridian Companion cards. Note the sequence of the cards; they must remain in the same order.
6. Remove the cards from the Module.
7. Relocate and reenable other Meridian 1 IPE Module cards, as described in “Meridian 1 card maintenance” on page 124.
8. Relocate TCM connections for the Base Stations, RAD, and Administration Terminal by reconnecting the original cabling to the new card slots or by rewiring the cross connections.
9. Install the Meridian Companion cards in their new slots, keeping the original order.
10. Install faceplate cables from right to left so the last connection is made between the CMCC and the card to its right.

When the connection to the CMCC occurs, the system LED will resume flashing as the system begins to initialize the expansion cards. The card LED may turn off, then turn on as initialization progresses. When the system LED stops flashing and stays on, the initialization is complete. All card LEDs should also be solid.

11. Reprogram the Meridian 1 system to relocate portable telephone user TNs to their new card and unit (if applicable) positions. Enable the cards from the Meridian 1 side.

### **ATTENTION!**

Maintain the same relative slot positions when reprogramming WTNs. Otherwise, users will not receive their calls.

12. Enable the cards from the Meridian 1 side. The Administration Terminal will display **System startup**.

**Note:** If the Administration Terminal is not functioning, make sure that it is properly connected to the first port on the CMCC card.

13. Enter a Maintenance programming session, reenable the system, and press **Rls** to exit.

Once the enabling is complete, the Administration Terminal will display one of the following:

- a **Config warning** message
- **System online**
- a **Config failure** message

14. Follow the instructions described in the paragraph that relates to the message displayed.
  - a. A configuration warning message is normal, and is accompanied by two options, **RESET** and **RESUME** . If M1 programming and rewiring are complete, press **RESUME** .
  - b. **System online** appears if the M1 reprogramming and rewiring has been into a new IPE Module and the cards are occupying exactly the same slots as in the previous module. No action is required; proceed to step 19.
  - c. The configuration failure message indicates that the cards have not been installed correctly (that is, in their original order). Repeat steps 9 through 12.
15. After pressing **RESUME** , you will see **System startup**, followed by **System online** . If Base Stations have not been properly reconnected to the new card slot and TCM device positions, a **Re-Eval required** message displays. Follow these steps:
  - a. Clear the alarm message (see “Responding to event and alarm messages” on page 139).
  - b. Rewire as necessary.
  - c. Restart the system.

**Note:** Auto Administration does not report missing Base Stations, only those that have been relocated to a different address. Even if the **Re-Eval required** message does not display, it is important to proceed with the next two verification steps.

16. Using the instructions described in “Card Status” on page 128, verify that all cards are present and appear in the **Idle** state.
17. Using the instructions described in “TCM Status” on page 132, verify that all Base Stations are located in the appropriate slots and that the Administration Terminal is in the first CMCC port.
18. Set the proper system date and time as described in “Programming the system time and date” on page 90.
19. Verify proper operation by placing a call to at least one portable telephone on each card.

## Replacing a defective expansion card



### **STATIC!**

**Wear a grounding strap.**

Do not touch the printed circuit board or the connector. The printed circuit board is a static-sensitive device.

“Troubleshooting cards” on page 165 lists the signs that indicate the need for a card replacement. Card replacement should be performed when the card is idle.

If the defective expansion card is on the far right of the Meridian Companion set of cards, it can simply be removed and replaced with a new card. If the card is in the middle of the card set, replace it by following these steps:

1. Disable the card from the Meridian 1 system and the Meridian Companion system.
2. Open the door of the IPE or CE/PE Module or expansion cabinet.



### **WARNING!**

Each maintenance cable has a left plug and a right plug. Switching the plugs will disable the Meridian Companion system.

3. Attach the left plug of the CMRC, CMLC or CMBC maintenance cable to the interboard faceplate cable harness or bypass faceplate cable harness to the left of the defective card.
4. Attach the right plug of the maintenance cable into the cable harness to the right of the defective card.

**Note:** The maintenance cables for CMRC and CMLC/CMBC are wired differently and cannot be interchanged. The same cable is used to replace either the CMLC or the CMBC.

5. Lifting the faceplate connectors, unplug the faceplate cable harness from J1 and J2 of the defective card.
6. Remove the defective card.
7. Replace the defective card with a new card.
8. Attach the faceplate cables to the new card.
9. Remove the maintenance cable as shown in Figure 32: Maintenance cable, on page 157.
10. Reenable the card from the Meridian 1 system and the Meridian Companion system.

## Replacing a defective ROM card

If troubleshooting indicates defects, replace the ROM card.

**Note:** It is suggested that you perform a System Reevaluation and backup prior to replacing the ROM card.

1. Disable all Meridian Companion cards from the Meridian 1 card using the DISC command in LD 32.
2. Ensure proper system grounding by following ESD practices.
3. Disconnect the faceplate cable on the CMCC.  
All LEDs on other Meridian Companion cards turn on.
4. Remove the CMCC. The Meridian 1 system indicates that there is a card polling failure with the XMI001 LoopShelfCard.
5. Unscrew the ROM from the two plastic standoffs.

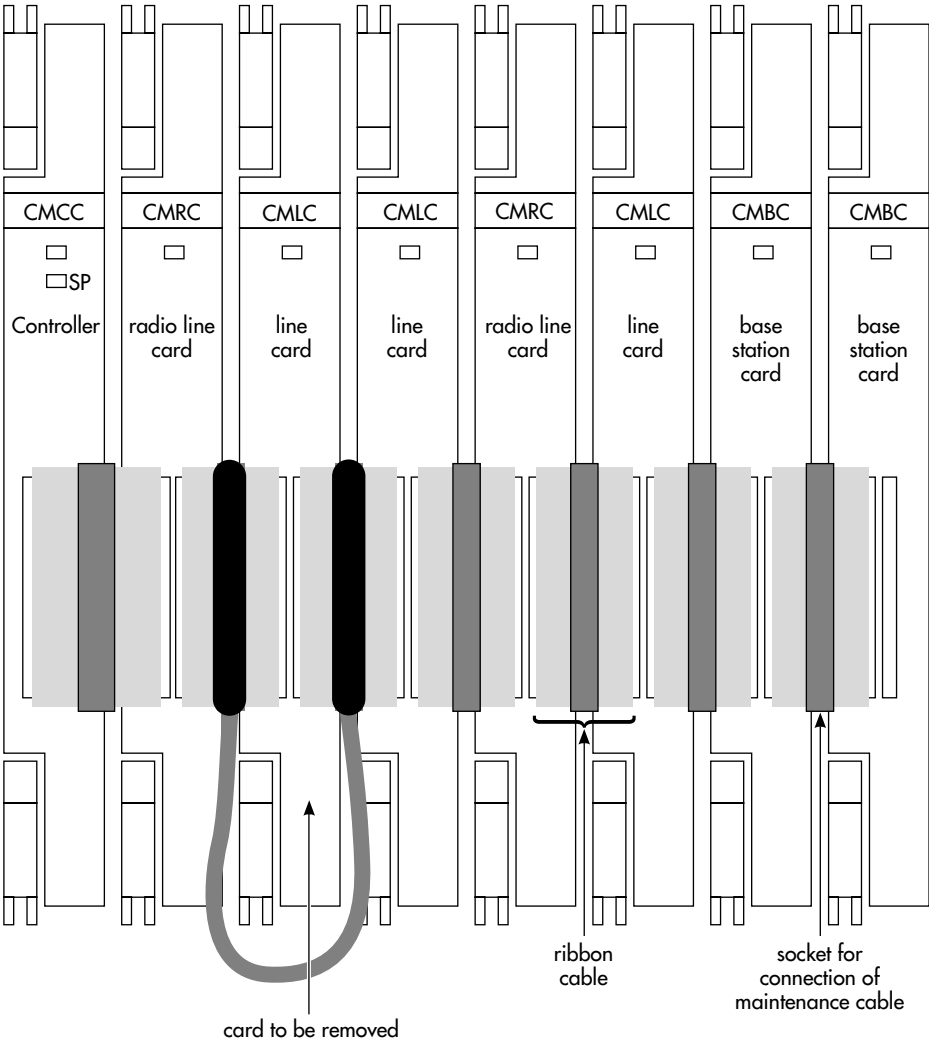
6. Slide the old ROM card from the right-angled connector mate P2.
7. Slide the new ROM card into the right-angled connector mate P2 on the CMCC.
8. Screw the new ROM card securely to the standoffs.
9. Reinstall the CMCC and reconnect faceplate cables.
10. Verify appropriate LED activity.

The Meridian 1 system indicates that card polling is reestablished with the XMI002 LoopShelfCard.

Wait for the system LED on the CMCC to stop flashing.

11. Use the Meridian Companion Administration Terminal to verify that the system is operating properly, that the ROM card software version is correct, and that there are no unexpected alarms or events.
12. Reset the Meridian Companion time and date.
13. Enable the cards from the Meridian 1 side.
14. Verify operation using a portable telephone.

Figure 32: Maintenance cable



## Replacing a defective CMCC



### **STATIC!**

**Wear a grounding strap.**

Do not touch the printed circuit board or the connector. The printed circuit board is a static-sensitive device.

**Note:** Before replacing the CMCC, you must perform a system backup and record the current SSN. Change the new CMCC SSN to the original (Regression code) SSN. Perform restore.

If troubleshooting procedures indicate that the CMCC should be replaced

1. Disable all Meridian Companion cards from the Meridian 1 side.
2. Open the door of the IPE or CE/PE Module or expansion cabinet.
3. Lifting the faceplate connector, unplug the faceplate cable from the CMCC J2 slot.
4. Remove the defective CMCC card.
5. Remove the ROM from the defective CMCC.
6. Install the ROM on the new CMCC.
7. Install the new CMCC into the slot.
8. Reconnect the faceplate connector.
9. Reprogram the system as described in “Programming the Meridian Companion system” on page 73 or, if you have Companion Manager installed, perform a restore operation.
10. Reenable the cards on the Meridian 1 side.

## Replacing a defective remote power interconnect unit

If “Troubleshooting a remote power interconnect unit” on page 170 indicates that the RPI is defective, replace it as follows:

1. Perform an orderly shutdown of the TCM ports associated with the RPI using the instructions in “TCM Status” on page 132.



2. Unplug the RPI power cord from the AC outlet.
3. Press the release catch with a screwdriver and open the cover.
4. Disconnect the wires from the RPI.
5. Remove the two bottom screws.
6. Lift up and remove the RPI.
7. Hang the new RPI on the two top screws.
8. Install and fasten the two bottom screws.
9. Reconnect all the wires to the RPI.
10. Close the RPI cover.
11. Plug the RPI power cord into the AC outlet.
12. Reenable the TCM ports associated with the RPI using the instructions in “TCM Status” on page 132.
13. Perform reevaluation if necessary.

### **Replacing an RPI power unit**

If the problem appears to be related to the power supply unit, follow these instructions.

#### **ATTENTION!**

**Unplugging an RPI renders any attached Base Station out of service.**

1. Perform an orderly shutdown of the TCM ports associated with the RPI using the instructions in “TCM Status” on page 132.
2. Unplug the RPI power cord from the AC outlet.
3. Press the release catch with a screwdriver and open the cover.
4. Disconnect the jumper lead, grounding plates, grounding strap, and cable from the connection board.
5. Unscrew the power supply unit and remove it.

6. Place the new power supply unit and fasten its screws.
7. Connect the jumper lead, grounding plates, grounding strap, and cable from the connector board.
8. Close the cover.
9. Plug the RPI power cord into the AC outlet.
10. Reenable the TCM ports associated with the RPI using the instructions in “TCM Status” on page 132.
11. Perform reevaluation if necessary.

## **Replacing a defective Remote Access Device**

Remove it, then replace it with a new unit following instructions in “Installing a Remote Access Device” on page 47.

## **Replacing a defective Administration Terminal**

A system Administration Terminal that cannot access the Meridian Companion system may be defective. To replace the defective terminal, disconnect its telephone cord, then install a new terminal using the instructions in “Installing a Companion Administration Terminal” on page 42.

## **Replacing a portable**

1. Deregister the portable from all systems to which it is registered.  
*Note:* If the portable is deregistered outside the range of a system, it is necessary to perform deregistration of the appropriate ports on the system prior to attempting to register another portable.
2. Register the new portable following the instructions in “Registering portable telephones” on page 121.

## **Handling Meridian Companion exceptions**

An exception during system initialization or operation can disable the system, except for the Administration Terminal, dropping all calls. As the system enters a disabled state, the Administration Terminal displays an exception message, preempting any existing alarm message.

The three defined Meridian Companion abnormalities, listed below, relate to configuration inconsistencies and are described in the sections that follow.

- Config warning: Recoverable inconsistency
- Config failure: Nonrecoverable inconsistency
- Config ambiguous

During a Meridian Companion exception, the feature key is disabled, preventing you from entering a feature session. The only available actions are RESET and RESUME , as shown by the softkeys. They are described below.

### **Config warning: Recoverable inconsistency**

A recoverable inconsistency occurs only during system startup after system cards have been relocated (moved as a group without changing relative card positions; see “Relocating the system” on page 151). It serves to remind the installer that all WTNs must be reprogrammed from the Meridian 1 system and that MDF cabling must be consistent with the new card locations.

The message **Config Warning** displays after initialization. If the reprogramming and cabling have been performed correctly, you can press RESUME to tell the system to overwrite the old position information and reactivate the system.

Otherwise, you must press RESET . This triggers the installation procedure. A warning message informs you that all data will be erased.

### **Config failure: Nonrecoverable inconsistency**

A nonrecoverable inconsistency can occur during startup or during operation when the system determines that the cards are in a different order from the configuration stored in memory. Card type order has not been preserved, making portable telephone registration data and system configuration data invalid. This can occur if a previously programmed CMCC has been moved to another Meridian 1 system with a different expansion card configuration, or if an installer has replaced an existing CMLC with a CMRC to add Base Station capacity.

The message **Config Failure** displays. There are two possible actions.

**Note:** If you press RESUME without correcting the problem that triggered the **Config Failure** (by returning cards to their old positions), the system

will reset itself, once again detect an inconsistency, and display the message again.

1. You can restore the card configuration to its original state, then press RESUME .
2. To keep the new configuration, you must press RESET . This triggers the installation procedure. A warning message informs you that all data will be erased.

## **Config ambiguous**

The Config ambiguous alarm occurs because

- there is one or more empty slots between cards
- a known module has not reported a location
- the system cannot identify a CMBC without at least one powered Base Station connected to it
- the system cannot identify a CMBC to the right of another CMBC that does not have at least one powered Base Station connected to it

Correct the problem and press RESUME.

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# Troubleshooting

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When evaluating malfunctions, it might be useful to refer to “Normal LED behavior upon installation” on page 60.

## General troubleshooting procedures

To carry out general troubleshooting procedures, use the following table. These procedures are most effective if you perform them in sequence.

Main task	Steps to follow
1. Diagnose the trouble.	Ask the users for information about <ul style="list-style-type: none"><li>the type of problem they have experienced (placing or receiving calls, dropped calls or noise, or to problems with a feature)</li><li>how frequently the problems have occurred</li><li>where the problems have occurred</li><li>how many portables are affected</li></ul>
2. Check how a feature is being used.	A problem may have been reported because of a misunderstanding about how a feature works. Confirm that the person who reported the problem understands the intended use and operation of all features in question.
3. Check that you can access host switch features from the Meridian Companion system.	To verify if the access lines have been programmed correctly, try the host switch features on two or more portables.

Main task	Steps to follow
4. Check for programming errors.	Check that the programming recorded in <i>Meridian Companion Programming and Provisioning Record</i> is correct for the intended operation of the system. See the specific procedures for troubleshooting problems in this chapter.
5. Check wiring and hardware connections.	Check the wiring and hardware connections. Check for open circuits through the secondary protectors for applications with exposed wiring. See procedures in “Troubleshooting cards” on page 165.
6. Check equipment defects.	If hardware is defective, replace it.  If the problem requires expert advice, follow your company's procedure for obtaining assistance.
7. Check wireless communication.	Check that you can make and receive calls from various portables.
8. Verify connection.	For each cell center in the system, verify that you can establish a connection with all the radios at that cell center. To identify a radio's cell, see “Identifying a radio's cell assignment” on page 101.

## Troubleshooting power problems

If the power fails or if the Meridian Companion system is disconnected, all Configuration and Administration data is retained for 72 hours. Check the following if you experience a power failure:

**Table 37 : Power troubleshooting**

Symptom	Possible problem and solution
Entire system is not working.	Make sure the IPE Module has power.
LEDs on one Base Station are off.	The Base Station or its power source may be defective. See "Troubleshooting a Base Station" on page 169.
LEDs on multiple Base Stations are off.	An RPI may be defective. See "Troubleshooting a remote power interconnect unit" on page 170.

After 72 hours without power, the system may lose its SSN and you will have to obtain a Regression Code to restore wireless communication. See "Handling Meridian Companion exceptions" on page 160.

## Troubleshooting cards

Troubleshoot cards using visual inspection and Meridian Companion maintenance.

1. Verify that LEDs are functioning properly as described in "Normal card LED behavior" on page 166.
2. Check the status of the cards as described in "Card Status" on page 128.
3. Disable, then enable any suspicious card using the procedure described in "Card Status" on page 128.
4. Repeat as necessary.

## Normal card LED behavior

The following two tables describe incidents affecting LED behavior that occur after the system is operational.

**Table 38 : Incidents affecting system LED**

Incident	Result
new card is added	LED flashes as a new card is added to the live system; the flashing indicates that the card (and any associated TCM device) is initializing (Flashing lasts approximately 30 seconds per card); following initialization, LED is off
warm reset or power up occurs	normal startup sequence followed by flashing that continues until CMCC and all connected expansion cards have completed initialization; LED goes off and stays off
previous disconnected expansion card is reconnected to a live system	LED flashes to indicate that the cards and any associated TCM devices are initializing; after initialization, LED turns off unless system detects that the cards are not in the same order as previously recorded (a non-recoverable inconsistency), in which case system is disabled and LED changes from flashing to on until exception is cleared
Administration Terminal or Companion Manager user disables system	LED goes on
system is powered up after being moved	normal startup sequence followed by flashing that continues until CMCC and all connected expansion cards have completed initialization; after flashing stops, LED is on solid, indicating system is disabled due to config warning
system is powered up after any CMRC, CMLC, or CMBC have been rearranged	normal start-up sequence followed by flashing that continues until CMCC and all connected expansion cards have completed initialization; after flashing stops, LED is on solid, indicating system disabled due to config failure



After initialization, the card LED status depends on the following:

- whether the expansion card is connected to the CMCC
- whether the card has been enabled from the Meridian 1 system
- whether the card has been enabled by Meridian Companion from either the Administration Terminal or Companion Manager
- whether the Meridian Companion system is operating properly

**Table 39 : Card LED behavior**

<b>Connected to CMCC?</b>	<b>Meridian 1: enabled/disabled</b>	<b>Meridian Companion: enabled/disabled</b>	<b>Companion system power status</b>	<b>LED behavior</b>
not connected	N/A	N/A	powering up	remain on after flashing three times
being connected	enabled	N/A	normal	go off quickly
already connected	enabled	N/A	powering up	flash three times, go on, then go off quickly
being connected	disabled	card and system enabled	normal	go off slowly
being connected	disabled	system disabled	normal	remain on
being connected	disabled	system enabled; individual cards disabled	normal	LEDs of disabled cards on; others go off slowly
already connected	disabled	card and system enabled	powering up	flash three times, go on, then go off slowly (one at a time, 20 seconds apart)
already connected	disabled	system disabled	normal	remain on

**Table 39 : Card LED behavior (continued)**

Connected to CMCC?	Meridian 1: enabled/disabled	Meridian Companion: enabled/disabled	Companion system power status	LED behavior
already connected	disabled	system enabled; individual cards disabled	powering up	flash three times, go on, then LEDs of disabled cards stay on; others go off slowly
already connected	disabled	disabled	normal	LED goes on
already connected	reenabled from either side after being disabled from both sides		normal	LED goes off

## Troubleshooting the Administration Terminal

**Note:** If the CMCC system LED has stopped flashing and the Administration Terminal has no display, it is not properly connected to the CMCC. If the CMCC system LED stops flashing but the Administration Terminal button LCDs continue to flash, the Administration Terminal is not connected to one of the first five TCM ports on the CMCC. In either case, check the main distribution frame wiring and correct any problem.

1. Check that the time and date appear on the display.
2. Check the display. If the display is unreadable, ensure that the display contrast adjustment (  Feature  \*  7 ) is adequate.
3. Check that power is on in the system.
4. Check that the Administration Terminal is connected to the correct port.
5. Check the 50-pin connectors at the system and make sure they are plugged in properly.
6. Check the 25-pair TCM cables at the distribution frame to make sure they are connected to the right ports.
7. Check the telephone wiring connections at the distribution frame to make sure the connections have been made on the appropriate connectors (see “Installing the hardware” chapter).

8. Replace the Administration Terminal with a working Administration Terminal. If the problem persists (see “Troubleshooting” on page 163).

**Note:** You should find between 18 and 21 V DC across the telephone wires when the Administration Terminal is disconnected.

## Troubleshooting a Base Station

1. Verify that the green LED (the power indicator) is on.
2. Verify that the red light is not solid.

A solid red light indicates that both radios on the Base Station are busy with calls, the system is in a Maintenance state, that the system is downloading data to the Base Stations, or that the radios have not been assigned to a cell.

3. Verify that the red light is not flashing.

The red LED flashes for about 15 seconds when a Base Station is powered up. This is normal. If the red LED continues to flash, then one of the following problems may exist:

- The Base Station is not connected to the Controller or line card.
- The wiring to the Base Station is not correct. Check for open circuits through the secondary protectors for applications with exposed wiring.
- The two-way DC loop resistance of the power pair(s) between the RPI and the Base Station exceeds 100  $\Omega$ . Measure the loop resistance with an ohmmeter. If the resistance exceeds 100  $\Omega$ , install a second power pair.
- The Base Station or RPI is faulty.

If the red LED is flashing on multiple Base Stations, one of the following problems may exist:

- The CMCC, CMRC, or CMBC card associated with the Base Stations may not be in place.
  - The MDF cable may have been removed.
4. Verify that the power cord of the RPI is properly connected to a working AC outlet. If the Base Station is powered locally, verify that the power

supply is properly connected to a working AC outlet and that the power supply cable is properly connected to the Base Station power connector.

5. If an external antenna is installed, verify that the external antenna's coaxial cable is properly connected to the BNC connector of the Base Station, and that the corresponding radio is programmed to have an external antenna. See "Setting the antenna type for a radio" on page 87.

## Troubleshooting a remote power interconnect unit

Multiple Base Station malfunctions usually indicate an RPI problem.

1. Verify that the card associated with the RPI is properly engaged in its slot.
2. Verify the Base Stations.
  - a. Check to see that the green light is on.
  - b. Check to see that the red light is not solid.

A solid red light indicates that both radios on the Base Station are busy, the system is in a Maintenance state, that the system is downloading data to the Base Stations, or that the radios have not been assigned to a cell.

- c. Check to see that the red light is not flashing.

The red light flashes for about 15 seconds when a Base Station is powered up. This is normal. If the red light continues to flash, then one of the following problems may exist:

- The system is not on.
- The Base Station is not connected to the system.
- The Base Station radios have not been assigned to a cell.
- The wiring to the Base Station is not correct.
- The two-way DC loop resistance of the power pair(s) between the RPI and the Base Station exceeds 100  $\Omega$ . Measure the loop resistance with an ohmmeter. If the resistance exceeds 100  $\Omega$ , install a second power pair.

- The distance between the RPI and the Base Station is in accordance with the values in Table 4 in the chapter “Installing the hardware.” If not, power the Base Station with a plug-top power supply, move the RPI closer to the Base Station, or use two RPI power pairs if you were using only one.
  - There is a faulty Base Station or RPI.
3. Verify that the RPI is connected to a working power source and that all connections to the RPI (power cord, jumper lead, input and output, etc.) are correct and secured.
  4. Check that the UPS fuse is live.
    - a. Remove the RPI cover.
    - b. Unplug the RPI from the AC outlet.
    - c. Remove the fuse cover.
    - d. Visually inspect the fuse to see if it needs replacement.
    - e. Replace the fuse if necessary.
  5. Make sure the TCM device wiring has been correctly installed.
  6. If none of the Base Stations connected to the RPI (or to one of its power supply units) are functioning correctly, replace the RPI (or power supply unit).
- Note:** The left power supply unit provides power through output connectors OBIX1 to OBIX8, and the right power supply unit provides power through OBIX9 to OBIX16.
7. If only one or a few of the Base Stations seem faulty, try putting the Base Station on another RPI power pair connector. If you continue to have difficulty, see “Troubleshooting a Base Station” on page 169.

## Troubleshooting portable telephone problems

When there is a problem with a portable telephone

1. Make sure the portable telephone is designed to be compatible with Meridian Companion.
2. Verify that the portable telephone is on and that the battery is not low.
3. Establish a radio connection to get dial tone. (Ensure that the portable telephone's twinned desk telephone, if any, is idle.)
4. On a portable, press **Feature** . The display shows **FEATURE LIST** .
5. Press **▽** or **△** until the display shows **Feature request** .
6. Press **SELECT** . The display shows **A-** .
7. Press **\* 0** . The display shows the number to which the portable telephone is registered.
8. See Table 40 for a summary of troubleshooting techniques.

**Table 40 : Troubleshooting portable telephones**

Problem	Cause	Solution
<ul style="list-style-type: none"> <li>no link, phone icon does not go off hook</li> <li>"connection failed" message displays</li> </ul>	<ul style="list-style-type: none"> <li>batteries are defective, not charged, or not installed</li> <li>portable is out of range of all working Base Stations</li> <li>portable telephone is not registered</li> <li>all Base Stations are busy</li> <li>wrong system is selected</li> </ul>	<ul style="list-style-type: none"> <li>replace, charge, or install batteries</li> <li>ask technical support for assistance</li> <li>repeat registration process for the portable telephone</li> <li>retry call or move to another cell</li> </ul>
<ul style="list-style-type: none"> <li>link is established, but there is no dial tone</li> </ul>	<ul style="list-style-type: none"> <li>telephones are MADN, and the other telephone is off-hook</li> <li>Meridian 1 programming problem: WTN is enabled but not configured</li> </ul>	<ul style="list-style-type: none"> <li>make sure other telephone is not off-hook</li> <li>ask technical support to check that the Meridian 1 system is correctly programmed</li> </ul>

**Table 40 : Troubleshooting portable telephones (continued)**

Problem	Cause	Solution
<ul style="list-style-type: none"> <li>link is established, but there is an overflow tone</li> </ul>	<ul style="list-style-type: none"> <li>WTN module from the Companion side is disabled or defective or failed</li> <li>Meridian 1 TN or card is disabled, defective, or has failed</li> </ul>	<ul style="list-style-type: none"> <li>ask technical support for assistance in correcting the Companion or Meridian 1 problem</li> </ul>
<ul style="list-style-type: none"> <li>voice quality is poor</li> <li>calls are frequently dropped</li> </ul>	<ul style="list-style-type: none"> <li>there is a portable telephone or system problem</li> </ul>	<ul style="list-style-type: none"> <li>try another portable telephone; if the problem still exists, it is related to the system (poor coverage) and should be reported to technical support; otherwise, the portable telephone is defective and should be replaced</li> </ul>

## Troubleshooting a RAD

There are two ways to tell if the RAD is not functioning properly.

- If the Administration Terminal can communicate with the Meridian Companion system but the remote PC cannot, the problem may be due to a malfunctioning RAD.
- The techniques described in “TCM Status” on page 132 indicate that the RAD has failed or that the port is not equipped.

## Troubleshooting an alarm

**Table 41 : Alarm troubleshooting**

Alarm	Meaning	Possible causes and actions
Alarm10	All TCM devices, including the Administration Terminal, have been disconnected from the CMCC.	<p>This alarm is usually discovered after the problem has been corrected (because the Administration Terminal is nonfunctional while the alarm is active). If it occurs unexpectedly</p> <ol style="list-style-type: none"> <li>1. Verify that the 25-pair cable connector is inserted properly.</li> <li>2. If there are TCM devices connected to the system, check all the wiring associated with these TCM devices.</li> </ol>
Alarm11	The internal circuitry has failed.	<p>The CMCC is defective</p> <p>Replace the CMCC (follow the instructions on page 158).</p>
Alarm:23-xx	Cell xx is out of service because there are no operational radios in that cell.	<p>This alarm occurs only at the end of System Reevaluation. During the last step of reevaluation, or after a system restart, as the system was activating cell xx for use, it could not find a radio to serve as a CSC.</p> <p>Check for the presence of the Base Station in cell xx. If the Base Station is present and in maintenance state, execute System Reevaluation. If the Base Stations do not appear, check the wiring and power. Replace the Base Station if it is defective. After replacement, reexecute System Reevaluation.</p>



**Table 41 : Alarm troubleshooting (continued)**

Alarm	Meaning	Possible causes and actions
Alarm:24	Wireless communication may be disabled the next time the system is powered up.	<p>This message occurs only at the end of System Reevaluation. It could be due to one of the following:</p> <ul style="list-style-type: none"> <li>• The system has fewer than four cells.</li> <li>• The system is brought online before all Base Stations are properly connected.</li> <li>• There is a break in the power or TCM connections to some Base Stations.</li> </ul> <p><b>Note:</b> Do not attempt to solve the problem by repowering.</p> <ol style="list-style-type: none"> <li>1. Check that the correct number of Base Stations have been connected and that the system recognizes the Base Stations (see page 145). If all the Base Stations you expected to see are not showing or they are in a failed state, check <ul style="list-style-type: none"> <li>• that the TCM wiring of Base Stations is correct</li> <li>• that there is power to the Base Stations and RPIs or plug-top power supplies</li> <li>• that the location and number of Base Stations are correct</li> <li>• that any Base Station Modules are properly connected to the expansion ports</li> </ul> </li> <li>2. Once you have corrected the problem run a System Reevaluation (see "System Reevaluation" on page 140).</li> </ol> <p>If you continue to experience Alarm:24 after running System Reevaluation, you have either insufficient Base Stations or an insufficient deployment.</p>

**Table 41 : Alarm troubleshooting (continued)**

Alarm	Meaning	Possible causes and actions
Alarm:50-cc	<p>All Base Stations on card cc have become disconnected from the system for at least 1 minute.</p> <p>or</p> <p>Card cc, which was restarted more than 3 minutes ago, has no operating Base Stations.</p>	<p>The MDF cable from the IPE slot containing CMRC has been disconnected. Reconnect the cable.</p> <p>Power to all Base Stations connected to the CMRC card has been lost (RPI is defective or disconnected). Check that the RPI is connected or replace defective RPI.</p> <p>A faceplate cable in the chain between the CMCC and this CMRC or CMBC has been disconnected or loosened from its connector. Remove and replace the cable.</p> <p>The CMRC or CMBC is defective. Replace the CMRC or CMBC.</p>
Alarm:51-cc	<p>All 16 WTNs (or 32 WTNs for MC32 feature with package 350) on CMRC or CMLC have been disconnected from the system for at least 1 minute.</p> <p>or</p> <p>CMRC, CMLC, or CMBC cc, which was restarted more than 3 minutes ago, is still not operational</p>	<p>The CMRC has been disconnected from the IPE Module slot. Reconnect the CMRC.</p> <p>A faceplate cable in the chain between the CMCC and this CMRC or CMLC has been disconnected or loosened from its connector. Reconnect the cable.</p> <p>CMRC, CMLC, or CMBC has an internal defect. Replace it.</p>
Alarm:53-ccuun	<p>An internal Base Station error has occurred.</p>	<p>Actions/causes depends on failure indicated in the event code. See associated 30X event code in Table 42.</p>
Alarm:56-ccuu	<p>A TCM device ccuu failure has occurred.</p>	<p>There is a problem with the wiring to the device. Reconnect the CMRC.</p> <p>The power to the TCM device has been interrupted. Reconnect the power.</p> <p>The device has an internal defect. Replace it.</p>

**Table 41 : Alarm troubleshooting (continued)**

Alarm	Meaning	Possible causes and actions
Config warning	Cards have been relocated and the system is disabled.	See "Handling Meridian Companion exceptions" on page 160.
Config failure	Cards have not been reinstalled correctly in their original order and the system is disabled.	See "Handling Meridian Companion exceptions" on page 160.
Config ambiguous	The system cannot recognize a card.	Avoid empty slots between Meridian Companion cards. Make sure that every CMBC card has at least one Base Station connected and powered on. Correct the problem and press <b>RESUME</b> .
System coldstart	A nonrecoverable NVRAM corruption was detected during restart. A cold start occurs automatically. This message appears only at power up.	This is normal for a new installation. If this occurs on repowering an existing system, it means that the system has lost its memory.  Reprogram the system using the programming record. Reregister all portable telephones.
Re-Eval required	The Meridian Companion system has detected a need for System Reevaluation.	This message displays for three reasons. <ul style="list-style-type: none"> <li>• a new Base Station was added to the system</li> <li>• a Base Station was moved to a different port</li> <li>• a Base Station lost power and the TCM port location changed</li> </ul> Run System Reevaluation immediately or schedule a System Reevaluation.

**Table 41 : Alarm troubleshooting (continued)**

Alarm	Meaning	Possible causes and actions
Re-Eval recommended	The Meridian Companion system has detected a possible need for System Re-evaluation.	<p>This message displays when</p> <ul style="list-style-type: none"><li>• a Base Station is replaced with a new Base Station</li><li>• a Base Station loses power but the TCM port did not change</li></ul> <p>Action is left to installer's discretion.</p> <ul style="list-style-type: none"><li>• continue with System Reevaluation</li><li>• schedule a reevaluation</li><li>• <b>CLEAR</b> the message and continue without running System Reevaluation</li></ul>

## Understanding event messages

Event messages appear as items in the Administration log or the Event/Alarm log. Most of these event messages appear during normal maintenance. An installer may view the event messages to diagnose a problem in the system.

Each event is assigned a severity number. An **S** preceding this number (for example, **S4**), may appear in the event message. **S1** has the lowest priority. If the log is full, new event messages with a higher severity number replace existing event messages of a lower severity. For this reason, check event messages at regular intervals and deal with all messages.

**Table 42 : Event messages in the Event/Alarm log**

Event code	Meaning
EVT221	The Event/Alarm log has been cleared.
EVT222	The debugging facility has been accessed.
EVT299	The system has been restarted after a power outage.
EVT301-ccuux	Radio <b>ccuux</b> cannot successfully receive the data image during download.  Both radios belonging to the Base Station will be disabled. This may occur if the flash EEPROM is faulty. The Base Station should be replaced.
EVT302-ccuux	Radio <b>ccuux</b> cannot be written to during data transfer.  Both radios belonging to the Base Station will be disabled. The Base Station's flash EEPROM is faulty. The Base Station should be replaced.
EVT303-ccuux	Radio <b>ccuux</b> cannot be synchronized with the other radios in the system.  Both radios belonging to the Base Station will be disabled. The Base Station hardware is faulty. The Base Station should be replaced. Two events are raised: one for the B1 channel radio and another for the B2 channel radio. A corresponding alarm code 53 will occur
EVT304-ccuux	Radio <b>ccuux</b> cannot be synchronized with other radios because of system overload.

**Table 42 : Event messages in the Event/Alarm log (continued)**

Event code	Meaning
EVT305-ccuu2	<p>A B2 channel radio (radio 2 in this case) cannot be synchronized because the B1 radio was disabled in maintenance.</p> <p>Both radios belonging to the Base Station (on port ccuu) will be disabled. The B1 radio must be operational to synchronize both radios of the Base Station with other radios in the system. Two events are raised: one for the B1 channel radio and another for the B2 channel radio. A corresponding alarm code 53 will occur.</p>
EVT306-ccuu1	<p>A radio (radio 1 in this case) cannot be synchronized because there are no B2 channel radios.</p> <p>Both radios belonging to the Base Station (ccuu) will be disabled. Two events are raised: one for the B1 channel radio (as in this case) and another for the B2 channel radio. A corresponding alarm code 53 will occur.</p>
EVT307-ccuux00	<p>A recoverable radio fault has occurred.</p> <p>The radio will be reset. If a link is active when this error occurs, the link is dropped. Radio ccuux is returned to service.</p>
EVT307-ccuux01	<p>An unrecoverable radio fault has occurred.</p> <p>Radio ccuux will be disabled and taken out of service. If a link is active when this error occurs, the link is dropped. A corresponding alarm code 53 will occur.</p>
EVT307-ccuux02	<p>The built-in self-test on the Base Station has failed.</p> <p>Radio ccuux will be disabled and taken out of service. If a link is active when this error occurs, the link is dropped. A corresponding alarm code 53 will occur.</p>
EVT308-ccuux	<p>The Base Station is connected to a system that supports a radio protocol that Meridian Companion does not understand.</p>
EVT682 and EVT683	<p>These are informational event codes for use by Northern Telecom.</p>
EVT685	<p>A scheduled reevaluation was canceled by the system. This is caused by the time and date having been advanced passed the scheduled time and date.</p>
EVT848	<p>This is a link hand-off error. A small number of these each day is a normal occurrence.</p>
EVT849	<p>Synchronization error.</p>

**Table 42 : Event messages in the Event/Alarm log (continued)**

Event code	Meaning
EUT850	Synchronization error.
EUT851	This is a Base Station software diagnostic message.
EUT882	A reevaluation has been initiated. It precedes the Re-eval in prog alarm in the Event/Alarm log.
EUT887-01091	The reevaluation radio configuration software has encountered a problematic Base Station (on port 01091 in this case).

**Table 43 : Event messages in the Administration log**

Event code	Meaning
EUT220	The Administration log has been cleared.
EUT400	The system has been manually restarted.
EUT412	The Installer password has been changed. The parameter contains the extension number that changed the password.
EUT413	The Administration password has been changed. The parameter contains the extension number that changed the password.
EUT414	Someone tried to enter the system with an invalid Installer password.
EUT415	Someone tried to enter the system with an invalid Administration password.
EUT416	Someone has initiated a Configuration programming session.
EUT417	Someone has initiated an Administration programming session.
EUT419	The system time has been changed by a user.
EUT434	The Registration password has been changed.
EUT440	An invalid software code has been entered.
EUT450	Someone has initiated a Companion Manager session.

You should rarely see event messages other than those described in Table 42 and Table 43. Other messages occur when the Meridian Companion system has followed its normal recovery from an unusual combination of system

events. If the same event number keeps appearing and is not described in Table 42 or Table 43, report it to your installer or distributor.



## Appendix A: Programming overview

**Table 44 : Programming overview**

A. Configuration	B. Administration	C. Maintenance
<b>1. Telephony Data</b> Dial delay B03 Gain Values Side tone CMCC slot 32 WTN	<b>1. Registration</b> Mstr Reg Enbl WTN Reg Status Show WTN: Reg Locked:	<b>1. System Status</b>
<b>2. Mobility Data</b> Re-Evaluation Re-Eval status Re-Eval schedule	<b>2. User Options</b> Radio loss hdlng Change Default Dflt: Change WTN:	<b>2. Card Status</b> Show card:
<b>Radios</b> Show Radio: Cell Assignment Antenna Type	<b>3. Time and Date</b> Time Date	<b>3. WTN Status</b> Show WTN:
<b>Cells</b> Show Cell: xxx Cxxx: Radios	<b>4. Passwords</b> Admin. Password Reg. Password	<b>4. TCM Status</b> Show TCM:

**Table 44 : Programming overview (continued)**

A. Configuration	B. Administration	C. Maintenance
System LID		5. Evnt/Alrm Log
3. Admin. set data Installer Pswd		6. Admin Log

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## Appendix B: Regulatory information

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### Registration

This telephone system is registered with Industry Canada based upon compliance with CS-03. Connection of the Meridian 1 system to the Public Switched Network is made through a standard network interface jack, which you can order from your telephone company.

### Safety

The Meridian Companion system conforms to the requirements of Canadian Regulatory Standards as specified in CSA C22.2 No. 950-95.



#### **WARNING!**

**Do not connect the Administration Terminal or Base Stations directly to a CO line interface.**

Doing so may result in equipment damage.



## **CAUTION!**

**The Meridian Companion Administration Terminal and Base Stations must not be used as off premises equipment.**

Installers should check the lightning surge arrestors at the cable entry point to the building with special attention to the grounding. Any problems should be reported to your telephone company in writing.

Because Administration Terminals and Base Stations are not lightning protected, do not install them outside the building.



## **SHOCK!**

**To avoid electrical shock hazard to personnel or equipment damage, observe the following precautions when installing telephone equipment:**

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch telephone wires that are not insulated or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying the telephone lines.

**SHOCK!**

**Install an AC lightning surge arrestor in the AC outlet that connects to the equipment.**

Electrical surges, typically lightning transients, are very destructive to terminal equipment connected to AC power sources.

## Equipment attachment limitations

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational, and safety requirements. Industry Canada does not guarantee that the equipment will operate to the user's satisfaction. Before installing this equipment, you should have permission to connect to the facilities of the local telecommunications company. You must use an acceptable method of connection to install the equipment.

Compliance with the preceding conditions might not prevent degradation of service in some situations. Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the distributor. Any repairs or alterations made by anyone else to this equipment or any equipment malfunctions can give the telecommunications company cause to request disconnection of the equipment.

You should ensure for your own protection that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution might be particularly important in rural areas.

**SHOCK!**

**Users should not attempt to make electrical ground connections themselves.**

Users should contact the appropriate electronic inspection authority or electrician, as appropriate.

This equipment cannot be used on public coin phone service provided by the telephone company.

## **Telecom compliance**

The Meridian Companion system meets CS-03 Issue 7 requirements for loop start Central Office interface. The system includes wireless Base Stations for the purpose of this paragraph.

## **Telephone company notification**

You do not need to contact your telephone company before connecting a Meridian Companion system to the telephone network. The telephone company, however, might ask you to provide the following information:

- telephone number or numbers to which the system will be connected
- Industry Canada Registration Number (on the Industry Canada label)
- Load Number (on the Industry Canada label)
- type of jack (CA21A)
- Facility Interface Code (FIC)
- Service Order Code (SOC)

## **Rights of the telephone company**

If a Meridian Companion system is determined to be causing harm to the telephone network, the telephone company can discontinue your service temporarily. If possible, the company will notify you in advance, but if advance notice is impractical, you will be notified as soon as possible. You will be given the opportunity to correct the situation, and you will be informed of your right to file a complaint with Industry Canada.

Your telephone company might make changes in its facilities, equipment, operations, or procedures that could affect the correct functioning of your system. If the company does, you will be notified in advance, to give you an opportunity to maintain uninterrupted telephone service.

In the event of an equipment malfunction, all repairs will be performed by Northern Telecom Canada or one of its authorized dealers.

## Interference causing equipment

This class A digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations as detailed in document ICES-003.

Operation of this equipment is subject to the two following conditions:

1. This equipment may not cause interference.
2. This equipment must accept any interference, including interference that may cause undesired operation of the equipment.

## Load Number

The Load Number assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop that is used by the device to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the requirement that the sum of the Load Number of all the devices does not exceed 100. The Load Number of this unit is 8.

## Repair facility

Contact	Nortel Networks 155 Roundtree Dairy Road Unit #3 Woodbridge, Ontario Canada L4L 6E1
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## Note for hearing aid users

Use of the portable telephone may produce an audible tone within a hearing aid. A headset recommended for use with hearing aids can prevent the occurrence of the audible tone. Contact your distributor to order a headset.

## Privacy

Privacy of communications may not be insured when using Companion Telephones. Twinning to a desktop telephone may negatively impact privacy.



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## List of terms

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**Administration log** The Administration log is a list of significant user initiated events, for example, Configuration sessions (during which a change was made), invalid password attempts, and password changes. This log holds a maximum of 10 events, and should be checked and cleared periodically.

**Administration programming** Administration programming includes setting registration permission, user options, time and date, and passwords.

**Administration Terminal** A Northern Telecom M7310 wired terminal used to perform Administration and Configuration programming, perform maintenance activities, and display alarm messages. The Administration Terminal does not support voice telephony when connected to a Meridian Companion system.

**alarm code** A number that appears on the Administration Terminal display informing you of the type of fault the Controller has detected in the system.

**antenna** Each Base Station has its own built-in antenna. External antennae can be used indoors or outdoors to extend radio coverage to hard-to-reach places such as tunnels or stairwells.

**Base Station** A Base Station is the communication link between the portables and the Meridian Companion system. Each Base Station contains two radios and can handle two portable telephone calls simultaneously. A Base Station is indirectly connected to a CMCC, CMRC or CMBC.

**Calling Party Name Display (CPND)** Available on wireless telephones beginning with X11 release 20B. CPND enables portable telephones with displays to show the names of callers.

**CDS** See Companion Diagnostic Software.

**cell** The area covered by one or more radios in close proximity. One or more cells make up the coverage area. Cell sizes vary with layout and building architecture.

**cell boundary value** The minimum acceptable signal strength value (from a particular Base Station) specified for radio coverage. During site planning, this value is used to locate the outer edge of the coverage area for each cell (see Receive Signal Strength Indicator reading).

**cell center** The location of the radios or the external antennae serving a cell. This is the point of reference for determining the cell boundary.

**CMBC** Companion Meridian Base Station Card. Supports 16 Base Stations. It can be installed in the IPE Module, CE/PE Module or option 11 expansion cabinet.

**CMCC** Companion Meridian Controller Card. Supports the Administration Terminal or a RAD connected to a PC running Companion Manager, 15 Base Stations, and 16 portable telephones. With Feature MC32, CMCC supports the Administration Terminal or a RAD connected to a PC running Companion Manager, 15 Base Stations, and 32 portable telephones. It can be installed in the IPE Module, CE/PE Module, or Option 11 expansion cabinet.

**CMLC** Companion Meridian Line Card. Supports 16 portable telephones. With Feature MC32 enabled, CMLC supports 32 portable telephones. It can be installed in the IPE Module, CE/PE Module, or Option 11 expansion cabinet.

**CMRC** Companion Meridian Radio Line Card. Supports 16 portable telephones and 16 Base Stations. With Feature MC32 enabled, CMRC supports 32 portable telephones and 16 Base Stations. It can be installed in the IPE Module, CE/PE Module, or Option 11 expansion cabinet.

**Common Signaling Channel (CSC) radio** At each cell center, one radio (the CSC radio) is dedicated to locate and track portable movements. The other radios of that cell center (traffic radios) are used to establish voice connections with the portables.

Characteristics of CSC radios include the following:

- You cannot measure the RSSI of a CSC radio.

- When the voice traffic in a given cell is high, the CSC radio may be used as a traffic radio.
- The CSC radios are allocated randomly at startup.
- If a CSC radio is disconnected, the system chooses another radio at that cell center to be the CSC radio.

**Companion Diagnostic Software (CDS)** Provides access to real-time and historical radio performance on the Meridian Companion system. CDS runs on a PC (located either on-site or in a remote location), and connects to the Meridian Companion system through a RAD.

**Companion Manager** Administers one or more Meridian Companion systems. It can be used in addition to or instead of the Administration Terminal. Companion Manager runs on a PC (located either on-site or in a remote location) and connects to each system through a Remote Access Device [RAD]).

**Companion Meridian Base Station Card** See CMBC.

**Companion Meridian Controller Card** See CMCC.

**Companion Meridian Line Card** See CMLC.

**Companion Meridian Radio Line Card** See CMRC.

**coverage area** The area in which a portable user should be able to make and receive calls. It can include both indoor and outdoor areas, stairwells, elevators, etc. Base Stations are installed in strategic locations throughout the customer's premises creating a network of overlapping radio cells. Collectively, these radio cells are referred to as the radio coverage area.

**CPND** See Calling Party Name Display.

**CSC radio** See Common Signaling Channel radio.

**default** The settings for all parameters when the system is first installed. Defaults are automatically assigned at system startup. Settings are changed from their default values during programming.

**deregistration** Disabling a portable telephone from working on a wireless system.

**Directory Number** A number that can be assigned to a single telephone or to multiple telephones, for example, a portable telephone and a wireline. See TN.

**DN** See Directory Number.

**event message** Event messages are stored in the Event/Alarm log and displayed on the Administration Terminal during a Maintenance session. They record a variety of events and activities in the Meridian Companion system.

**Event/Alarm log** The Event/Alarm log is a list of system generated events and alarm codes. The Event/Alarm log holds a maximum of 50 events and should be checked and cleared regularly.

**expansion cabinet** A cabinet, required for Option 11 systems, that can accommodate Meridian Companion cards.

**exposed wiring** Telecommunications circuit wiring outside a building structure. Such wiring requires use of primary and secondary protectors.

**external antenna** A passive radio frequency receiver connected to a Base Station radio. An external antenna can be used instead of the internal Base Station antenna to extend radio coverage to hard-to-reach places or locations where Base Stations cannot be installed.

**hand-off** An active radio link to a portable is transferred from one Base Station to another in the Meridian Companion system (that is, when the user moves from one cell to another). Hand-off occurs when the Controller detects that the strength and quality of the radio signal have gone below a predefined threshold and there is a better radio connection available.

**Installer password** A one- to six-digit password that is used to prevent unauthorized access to programming, Maintenance, Memory Reset and System Startup. The Installer password can be changed in Configuration programming.

**IPE** Intelligent peripheral equipment. Meridian Companion cards are installed on the IPE shelf in Meridian 1 Option 21 through Option 81 systems.

**ISM** Incremental software management. Permits precise definition of user capacity and coverage.

**LID** See System LID.

**M7310 terminal** See Administration Terminal.

**Main Distribution Frame** Frame-mounted BIX modules that cross-connect Meridian 1 terminations. All Meridian Companion wiring connects to the Meridian 1 system through a Main Distribution Frame.

**Maintenance** Maintenance functions provide system backup and restore functions as well as diagnostic features for the system, cards, and devices.

**maintenance cables** Two cables, one for the CMLC and one for the CMRC, that allow a defective card to be removed without affecting operation of other cards.

**MCRA** See Multiple Call Arrangement Allowed.

**MCRD** See Multiple Call Arrangement Denied.

**MDF** See Main Distribution Frame.

**Message Waiting Indicator** A visual or audible telephone set indicator that alerts the user to the fact that a message is waiting.

**Multiple Appearance Directory Number (MADN)** A host switch feature that allows the assignment of the same host switch telephone number to any number of lines that are wired to the host switch.

**Multiple Call Arrangement Allowed** Prevents access to a conversation on a portable telephone from the corresponding wireline set. The portable telephone user can originate and receive calls when a set sharing the same DN is on a call.

**Multiple Call Arrangement Denied** Allows access to a conversation on a portable from the corresponding wireline set. The wireline user can listen in on the portable telephone user's calls.

**MWI** See Message Waiting Indicator.

**password** A specific sequence of digits entered from the Administration Terminal dialpad or through Companion Manager to gain access to Meridian

Companion operation and programming.

**PC** Personal computer.

**portables** The Companion portable is a battery-powered, pocket-size portable telephone. Meridian Companion can support up to 480 portable telephones depending on card configuration.

**Primary protector** A voltage surge protector connected between each line conductor and ground located where telecommunications conductors enter a building structure.

**Programming** The setting of various characteristics of the system. This includes system-wide settings and radio cell assignments.

**Programming Record** An on-site planning and reference document. All Configuration and Administration settings should be recorded in *Meridian Companion Programming and Provisioning Record*.

**Protocol Converter Unit (PCU)** Circuitry used on the CMCC and CMRC to provide signaling information.

**RAD** See Remote Access Device.

**radio link** A radio channel between the Base Station and the portable.

**Receive Signal Strength Indicator (RSSI) reading** The Meridian Companion system portables can display the current signal strength of the portable to the Base Station link. RSSI measurements are displayed as negative values; the smaller the negative value, the stronger the signal strength.

**registration** Meridian Companion enables portable telephone registration. Each portable telephone in the system must be registered to a Wireless Terminal Number (WTN).

**Registration password** Prevents unauthorized users from registering portables on the Meridian Companion system.

**Remote Access Device (RAD)** Allows a PC running Companion Manager or Companion Diagnostic Software to access the Meridian Companion system. Access may be established by connecting the RAD on the customer site using a local connection, or at a remote location using standard modem equipment.

**Remote power interconnect (RPI)** An interface providing remote power for the Base Stations. Each RPI can power up to 8 or 16 Base Stations.

**RPI** See remote power interconnect.

**RSSI** Receive Signal Strength Indicator.

**Secondary protector** A series-connected overcurrent protector, with optional voltage surge protection, located between a primary protector and the equipment.

**site planning** The process of positioning the Base Stations, antennae, and other hardware in the system to maximize coverage for the portable telephones and minimize the number of Base Stations required for acceptable performance. Refer to *Meridian Companion Site Planning Guide* for more information on site planning.

**System LID** The System Access Logical Identifier (LID) is a four-digit hexadecimal number by which the system identifies itself to portable telephones and which the portable telephones use to request service from the system. Only the installer can change the System LID.

**System Reevaluation** The process which automatically assigns Base Stations to cells and defines the cell configuration.

**System Security Number (SSN)** The unique number that identifies each Meridian Companion system.

**TCM** Time Compression Multiplexing.

**Time Compression Multiplexing (TCM) unit number** A four-digit number that identifies a card and unit (cc-uu). In Meridian Companion, one port supports the Administration Terminal or a RAD connected to an administration PC. (If a system has an Administration Terminal and a RAD, each has a separate port.) The other ports support Base Stations and portable telephones.

**TN** Terminal Number. A port on a Meridian 1 system to which a particular telephone set is connected.

**Version number** See system version.

**WTN** Wireless Terminal Number. A four-digit number that maps to a Terminal Number (TN) and can be assigned to a portable telephone.





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Meridian 1

## **Meridian Companion**

### **Installation and Maintenance Guide**

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